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ORIGINAL ARTICLES.

THE REPORT OF THE AMERICAN PEDIATRIC SOCIETY'S COLLECTIVE INVESTIGATION INTO THE USE OF ANTITOXIN IN THE TREATMENT OF DIPHTHERIA IN PRIVATE PRACTICE.[1]

THIS subject was chosen by the officers of the Society for its eighth annual meeting, with the belief that a large amount of valuable experience not otherwise available, might in this way be reached and collated. It was also believed that a more trustworthy estimate of the value of the serum treatment of diphtheria might thus be obtained than by statistics taken from hospital practice. There are very few hospitals in America that receive diphtheria patients, and the conditions under which patients are admitted to hospitals and the surroundings while there, are so different from those of private practice, that the measure of success in hospital cases cannot be taken as an index of the results which have been obtained upon this side of the Atlantic with the new treatment.

In order, therefore, to obtain an expression of opinion from American physicians as to the serum treatment, after what had been, with most of them, their first year's experience, a circular letter was prepared and issued by the Committee early in April. This was distributed through the members of the Society as widely as could be done during the time allowed. An attempt was made to reach as many physicians as possible who had had experience with the remedy.

The first surprise of the Committee was in learning how very widely the serum treatment had been employed, especially in the Eastern and mid-Western States. With more time, the number of cases collected might easily have been doubled and perhaps trebled; but enough reports have come in to enable one to see what opinion was held on the 1st of May, 1896, by American physicians who have used this remedy.

The circular letter asked for information upon the following points: Age; previous condition; duration of disease when the first injection was made; the number of injections; the extent of the membrane—tonsils, nose, pharynx, and larynx; whether or not the diagnosis was confirmed by culture; complications or sequelæ, viz., pneumonia, nephritis, sepsis, paralysis; the result; and remarks, including other treatment employed, the preparation of antitoxin used, and general impression drawn from the cases.

Reports were returned from 615 different physicians, with 3628 cases. Of these, 244 cases have been excluded from our statistical tables. These were cases in which the disease was said to have been confined to the tonsils and the diagnosis not confirmed by culture, and therefore open to question. A few cases were reported in such doubtful terms as to leave the diagnosis uncertain. The figures herewith given are therefore made up from cases in which the diagnosis was confirmed by culture (embracing about two-thirds of the whole number) and others giving pretty clear evidence of diphtheria, either in the fact that they had been contracted from other undoubted cases, or where the membrane had invaded other parts besides the tonsils, such as the palate, pharynx, nose, or larynx. It is possible that among the latter we have admitted some streptococcus cases, but the number of such is certainly very small.

There are left then of these cases, 3384 for analysis. These have been observed in the practice of 613 physicians from 114 cities and towns, in 15 different States, the District of Columbia, and the Dominion of Canada.

In the general opinion of the reporters the type of diphtheria during the past year has not differed materially from that seen in previous years, so that it has been average diphtheria which has been treated. If there is any difference in the severity of the cases included in these reports from those of average diphtheria, it is that they embrace a rather larger proportion of very bad cases than are usually brought together in statistics. The cases, according to the extent of the membrane, are grouped as follows: In 593 the tonsils alone were involved. In 1397 the tonsils and pharynx, the tonsils and nose, the pharynx and nose, or all three were affected. In 1256 cases the larynx was affected either alone or with the tonsils, pharynx, and nose, one or all. In many instances

[1] Reported at the Eighth Annual Meeting held at Montreal, Canada, May 26, 1896.

the statement is made by the reporters that the serum was resorted to only when the condition of the patient had become alarmingly worse under ordinary methods of treatment. This is shown by the unusually large number of cases in which injections were made late in the disease. Again, many physicians being as yet in some dread of the unfavorable effects of the serum have hesitated to use it in mild cases and have given it only in those which from the onset gave evidence of being of a severe type. The expense of the serum has unquestionably deterred many from employing it in mild cases. These facts, it is believed, will more than outweigh the bias of any antitoxin enthusiasts by including many mild cases which would have recovered under any treatment. It will, however, be remembered, that tonsillar cases not confirmed by culture have not been included.

Only two reports embracing a series of over one hundred cases have been received, most of the observers having sent in from five to twenty cases, although there are many reports of single cases, particularly of single fatal ones.

In addition to this material which has come in response to the circular, there have been placed at the disposal of the Committee, by the courtesy of Dr. H. M. Biggs, 942 cases treated in their homes in the tenements of New York. Of these, 856 were injected by the corps of inspectors of the New York Health Board, upon the request of the attending physician, and 86 others were treated by physicians receiving free antitoxin from the Health Board. In the first group the diagnosis of diphtheria was confirmed by culture in every case, and in all of the latter except 26; in these the diagnosis rested upon extensive membranous deposits or laryngeal invasion. The cases of the New York Health Board were of a more than ordinarily severe type, 485, or more than fifty per cent. of these being reported as being in bad condition at the time of injection; to mild cases the inspectors were not often called. Further, an unusually large number of them (thirty-eight per cent.) were injected on or after the fourth day of the disease. In 182 of these cases only the tonsils were affected; in 466 the tonsils with the pharynx or nose, the pharynx and nose, or all three; in 294 the larynx was invaded either with or without disease of the tonsils, nose, or pharynx.

Through the courtesy of Dr. Biggs the committee is able to include also a partial report upon 1468 cases from Chicago, treated in their homes in that city by a corps of inspectors of the Health Department. It was the custom in Chicago to send an inspector to every tenement-house case reported, and to administer the serum unless it was refused by the parents. These cases were therefore treated much earlier and the results were correspondingly better than were obtained in New York, although the serum used was the same in both cities, viz., that of the New York Health Board.

THE RESULT AS INFLUENCED BY THE TIME OF INJECTION.

In Table I are given the results obtained in these three different groups of cases, classified according to the day on which they received the first injection of serum antitoxin.

TABLE I.—DAY OF INJECTION AND RESULT.

	Injected on 1st Day.			Injected on 2nd Day.			Injected on 3rd Day.			Injected on 4th Day.			Injected on or after 5th Day.			Day of Injection Unknown.			Totals.		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
The Committee's Report,	764	38	4.9	1065	89	8.3	620	79	12.7	336	77	22.9	390	152	38.9	215	15	7.0	3384	450	13.0
New York Health Board,	126	11	8.7	215	26	12.0	228	37	16.6	153	32	20.9	203	59	29.0	17	4	23.5	942	169	17.8
Chicago Health Board,	106	0	0	336	5	1.5	660	18	2.7	269	38	14.1	97	33	34.0	0	0	0	1468	94	6.4
Totals, - - -	996	49	4.9	1616	120	7.4	1508	134	8.8	758	147	20.7	690	244	35.3	232	19	8.2	5794	713	12.3

The grand total gives 5794 cases, with 713 deaths, or a mortality of 12.3 per cent., including every case returned; but the reports show that 218 cases were moribund at the time of injection or died within twenty-four hours of the first injection. Should these be excluded there would remain 5576 cases (in which the serum may be said to have had a chance) with a mortality of 8.8 per cent.

Of the 4120 cases injected during the first

three days there were 303 deaths—a mortality of 7.3 per cent., including every case returned. If from these we deduct the cases which were moribund at the time of injection, or which died within twenty-four hours, we have 4013 cases, with a mortality of 4.8 per cent. Behring's original claim, that if cases were injected on the first or second day the mortality would not be 5 per cent., is more than substantiated by these figures. The good results obtained in third-day injections were a great surprise to your Committee. But after three days have passed the mortality rises rapidly, and does not differ materially from ordinary diphtheria statistics. Our figures emphasize the statement so often made, that relatively little benefit is seen from antitoxin after three days; however, it must be said that striking improvement has in some cases been seen even when the serum has been injected as late as the fifth or sixth day. The duration of the disease, therefore, is no contra-indication to its use.

THE INFLUENCE OF BACTERIOLOGICAL DIAGNOSIS UPON THE STATISTICS.

This is shown in Table II.

TABLE II.—DIAGNOSIS CONFIRMED BY BACTERIOLOGICAL EXAMINATION.

	Cases.	Deaths.	Mortality.
Committee's Report,	2453	302	12.3 per cent.
New York Board of Health,	916	160	16.9 "
Chicago " "	1468	94	6.4 "
Totals, - -	4837	556	11.4 "
(Excluding 145 cases which were moribund or which died in twenty-four hours), - - -			8.7 "

DIAGNOSIS FROM CLINICAL EVIDENCE ONLY.

	Cases.	Deaths.	Mortality.
Committee's Report,	931	148	15.7 "
New York Board of Health,	26	9	34.6 "
Totals, - -	957	157	16.3 "
(Excluding 72 cases either moribund or dying in twenty-four hours), - - - - - -			9.6 "

In the cases in which the diagnosis was not confirmed by a bacteriological examination the mortality is thus 5 per cent. higher than in the bacteriological cases. The difference is to be explained by two facts: first, as already stated, that we have excluded from our reports all tonsillar cases (and hence most of the very mild ones) not confirmed by bacteriological examinations; and secondly, by the fact that this group of cases comprises those treated in the country where physicians have hesitated to use antitoxin unless the type of the disease was a grave one, and where also a large proportion of the injections were made later than in the cities. However, should we leave out the moribund cases, the mortality is but 9.5 per cent., which differs but slightly from the cases confirmed by bacteriological diagnosis.

In our subsequent statistics we shall consider together all the cases bacteriologically confirmed and otherwise, as the statistics are not materially altered by this grouping.

THE RESULTS AS MODIFIED BY THE AGE OF THE PATIENTS.

Unfortunately the ages have not been furnished in the report of the Chicago cases, and we have therefore only the cases reported to the Committee and those from the New York Board of Health for analysis. In Table III is shown the mortality of the different ages grouped separately.

The highest mortality is seen as in all reports to be in the cases under two years, but including all those returned even those that were moribund when injected, the death rate was but 23.3 per cent. (21.7 per cent. of the Committee's cases), while if we exclude cases moribund when injected or dying within the first twenty-four hours, it falls to 19.2 per cent.

After the second year there is noticed a steady

TABLE III.—AGE AND RESULT OF TREATMENT.

	0 to 2 Years.			2 to 5 Years.			5 to 10 Years.			10 to 15 Years.			15 to 20 Years.			20 Years and Over.		
	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.	Cases.	Deaths.	Mortality per cent.
Committee's Report, - - - - -	631	137	21.7	1276	175	13.7	883	108	12.2	276	19	6.8	112	4	3.6	214	9	4.2
New York Health Board, - - - - -	236	65	27.5	466	83	17.8	178	21	11.8	29	0	0	11	0	0	22	0	0
Totals, - - - - - - -	867	202	23.3	1742	258	14.7	1061	129	12.1	305	19	6.2	123	4	3.2	236	9	3.8
Moribund, - - - - - - -	43			59			59			9			0			4		
Mortality Excluding Moribund Cases, -			19.2			13.3			8.7			3.3			3.2			2.1

decline in mortality up to adult life. In many of the reports previously published the statement has been made that no striking improvement in results was observed in adults cases treated by the serum. Our figures strongly contradict this opinion. Of 359 cases over fifteen years old, which were returned, there were but thirteen deaths. That the reader may judge for himself how far antitoxin is to be held responsible for the result, a brief summary of these thirteen cases is appended.

CASE I.—Fifteen years old; injected on the fourth day; membrane covering tonsils and pharynx; profoundly septic, sinking rapidly when injected; died in two hours. "My only death in seventeen cases." (Jones, Gloucester, Mass.)

CASE II.—Forty-four years old; injected on the fourth day; membrane on the tonsils and pharynx; in bad condition; died three hours after injection. The tonsils had been previously incised, the early diagnosis having been quinsy.

CASE III.—Thirty-one years old; injected on the sixth day; membrane on the tonsils, nose, pharynx, and larynx; intubation; sepsis; in bad condition; lived eight hours after injection.

CASE IV.—Thirty-five years old; injected on the fifth day; membrane on the pharynx and nose (?); in bad condition; septic; died in twelve hours.

CASE V.—Sixty years old; in bad condition; had serious mitral regurgitation; injected on the fourth day; membrane covering tonsils, pharynx, and larynx; died from heart failure on following day.

CASE VI.—Sixty years old; "kidney trouble for years;" injected on the third day; very extensive membrane, covering tonsils, pharynx, and nose; profound sepsis; in bad condition; died suddenly on the day after injection.

CASE VII.—Seventeen years old; in bad condition; convalescing from measles; enormous adenopathy; profound sepsis; exceedingly high temperature; membrane covering tonsils and nose; injected at the end of forty-eight hours; three injections, temporary improvement after each one; duration of life not given.

CASE VIII.—Fifteen years old; in bad condition; injected on the ninth day; membrane covering tonsils, nose, pharynx, and larynx; no operation; enormous infiltration of the tissues of the neck; nephritis; sepsis; lived four days and died of sepsis.

CASE IX.—Twenty years old; injected on the third day; membrane upon the tonsils, nose, pharynx, and larynx; "a stubborn patient, who got up before he was allowed, and died suddenly after it."

CASE X.—Twenty-five years old; injected on the fifth day; membrane covering both tonsils, entire pharynx, and completely occluding nose; nephritis and sepsis; throat cleared off entirely; died suddenly on the fourteenth day from cardiac paralysis.

CASE XI.—Nineteen years old; injected on the fifth day; membrane upon the tonsils and pharynx; profound sepsis; duration of life unknown.

CASE XII.—Twenty-two years old; injected on the fourth day; membrane on the tonsils and gums; sepsis; died on the sixth day.

CASE XIII.—The well-known Brooklyn case, reported in 1895. Girl, sixteen years old, who died suddenly, ten minutes after injection.

Such are the adult cases, which antitoxin failed to cure. Four of them were moribund at the time of injection, no one of them living over twelve hours. Two, both sixty years old, were already crippled by previous organic disease, one of the heart, and the other of the kidneys. In the measles case there was undoubted evidence of streptococcus septicemia. Only two of the cases were injected as early as the third day; three of them on the fifth day, and one on the ninth day. Omitting the four moribund cases, the mortality of 355 adult cases treated with the serum is 2.5 per cent.

PARALYSIS.

Reliable data upon this point and those hereafter to be mentioned are to be had only from the 3384 reports returned to the Committee. Of these, paralytic sequelæ appeared in 328 cases—9.7 per cent. Of the 2934 cases which recovered, paralysis was present in 276, or 9.4 per cent. Of the 450 cases which died, paralysis was noted in 52, or 11.4 per cent.

The variety of the paralysis and the date of injection is shown in Table IV.

Observations of some of the individual cases are interesting, particularly those of cardiac paralysis. It is twice stated that the child had gotten up and walked out of the house, where it was found dead. Twice death occurred after sitting up suddenly; once, on jumping from one bed into another. One patient of twenty years got up, contrary to orders, and died soon afterward. Another patient was apparently well, until he indulged in a large quantity of cake and candy, soon after which cardiac symptoms developed, and he died shortly. One case was that of a woman, sixty years old, who had serious organic cardiac disease.

It is difficult from these statistics to state what protective power the serum may have over the nerve-cells and fibers. Apparently this is not great, unless the injections are made early in the disease, and even then in severe cases the amount of damage done to these tissues in twenty-four hours may be very great, even irreparable. Time

is not the only element in estimating the effect of the diphtheria toxins.

Great discrepancy exists in the statements made regarding the frequency of paralytic sequelæ after diphtheria. In a series of 1000 cases reported by Lennox Browne, paralytic sequelæ were present in 14 per cent. In 2448 cases by Sanné, paralysis was noted in 11 per cent. In the series of cases here reported, the difference is slightly in favor of the antitoxin treatment, but paralysis is certainly frequent enough to show how extremely susceptible the nervous elements are to the diphtheria toxins. One thing is quite striking from a study of these cases, and that is the proportion that have died from late cardiac paralysis. That very many of them would undoubtedly have succumbed earlier in the disease from suffocation (laryngeal cases) or diphtheritic toxemia, had the serum not been employed, is beyond question. Although the serum is able to rescue even many such desperate cases, it cannot overcome the effects of the toxins upon the cells, which have occurred before it was injected.

SEPSIS.

Sepsis is stated to have been present in 362 of the 3384 cases, or 10.7 per cent. It was present in 145, or 33 per cent. of the fatal cases. Some explanation is necessary for a correct appreciation of these figures. The majority of the reporters, it is plain from their remarks, have not distinguished between diphtheritic toxemia and streptococcus sepsis. The former is certainly meant in the great majority of the cases. There is a very small proportion in which there is evidence of streptococcus sepsis. The six cases complicating measles and the five complicating scarlet fever, however, should possibly be included among this list.

NEPHRITIS.

The statements on this point are quite unsatisfactory. The reports state that nephritis was present 350 times, or in ten per cent. of the cases. On the one hand, it must be stated that the diagnosis of nephritis rests, in many cases, simply upon the presence of albumin in the urine; but, on the other hand, it is true that in a large number of the cases—more than half—no examination of the urine is recorded as having been made, so that it is impossible to state with anything like approximate accuracy, the frequency of nephritis in these cases. Of the 450 fatal cases, the presence of nephritis is mentioned without qualification or explanation in thirty-nine cases, these being usually put down also as septic, dying in the acute stage of the disease. There are fifteen fatal cases, however, in which the renal disease was stated as the cause of death. In no less than nine the nephritis occurred late in the disease, usually during the second or third week. In these fifteen cases the evidence of severe nephritis was conclusive, such symptoms being present as dropsy, suppression of urine, with coma or convulsions.

BRONCHO-PNEUMONIA.

Broncho-pneumonia is stated to have been present in 193 of the 3384 cases, or 5.9 per cent., a remarkably small proportion when compared with hospital statistics. Among the patients that

TABLE IV.—VARIETY OF PARALYSIS AND THE DAY OF INJECTION.

	Cases.	Day of Injection.					
Recovery Cases.		1st Day.	2d Day.	3d Day.	4th Day.	5th Day.	Unknown.
Paralysis mentioned (variety not specified),	132	8	32	32	19	16	23
Throat only (aphonia, nasal voice or regurgitation),	114	16	21	25	11	16	24
Extremities,	14	3	5	2	—	3	1
Ocular,	11	—	4	3	1	2	1
General (multitude neuritis),	4	—	1	2	1	—	—
Sterno-mastoid,	1	—	1	—	—	—	—
Fatal Cases.							
Paralysis mentioned (variety not specified),	9	—	3	2	1	2	1
[1] Cardiac, late after throat clear (in 4 of them throat also),	32	1	2	8	9	8	4
Throat only,	6	—	2	—	—	—	4
General late,	4	—	1	—	1	2	—
Muscles of Respiration,	1	—	1	—	—	—	—
Totals,	328	28	73	76	43	49	58

[1] Cases of heart failure occurring at the height of the disease have not been included here; although they are mentioned among the cases of cardiac paralysis in the table of fatal cases.

recovered, broncho-pneumonia was noted 114 times, or in 3.8 per cent.; among the fatal cases, 79 times, or in 17.5 per cent.; but in only about one-half of these was the pneumonia the cause of death. Of these, 37 were laryngeal cases, operated upon late; 10 were septic cases, and the pulmonary disease was coincident with the height of the diphtheritic process. In 7, pneumonia was independent of both the above conditions, occurring late in the disease in all but two.

LARYNGEAL CASES.

Of the 3384 cases reported to the Committee, larynx is stated to have been involved in 1256 cases or 37.5 per cent. This proportion is somewhat higher than is usual, and is partly explained by the fact that several physicians have sent in the reports only of their laryngeal cases. These laryngeal cases occurred in the practice of 379 physicians.

In 691, or a little more than one-half the number, no operation was done, and in this group there were 128 deaths. In 48 of them laryngeal obstruction was responsible for the fatal issue, operation being refused by the parents, or no reason for its being neglected having been given. In the eighty remaining fatal cases the patients died of other complications, and not from the laryngeal disease.

In the 563 cases, therefore, or 16.9 per cent. of the whole number, there was clinical evidence that the larynx was involved, and yet recovery took place without operation. In many of these cases the symptoms of stenosis were severe, and yet disappeared after injection without intubation. No one feature of the cases of diphtheria treated by antitoxin has excited more surprise among the physicians who have reported them, than the prompt arrest, by the timely administration of the serum, of membrane which was rapidly spreading downward below the larynx. Such expressions abound in the reports as "wonderful," "marvelous," "prepared to do intubation, but at my next visit the patient was so much better it was unnecessary," "in all my experience with diphtheria have never seen anything like it before," "no unprejudiced mind could see such effects and not be convinced of the value of the serum," etc.

In establishing the value of the serum, nothing has been so convincing as the ability of antitoxin, properly administered, to check the rapid spreading of membrane downward in the respiratory tract, as is attested by the observations of more than 350 physicians who have sent in reports.

Turning now to the operative cases we find the same remarkable effects of the antitoxin noticeable. Operations were done in 565 cases, or in 16.7 per cent. of the entire number reported. Intubation was performed 533 times with 138 deaths, or a mortality of 25.9 per cent. In the above are included nine cases in which a secondary tracheotomy was done, with seven deaths. In 32 tracheotomy only was done with 12 deaths, a mortality of 37.4 per cent. Of the 565 operative cases, 66 were either moribund at the time of operation, or died within twenty-four hours after injection. Should these be deducted, there remain 499 cases operated upon by intubation or tracheotomy, with 84 deaths, a mortality of 16.9 per cent.

Of the 2819 cases not operated upon, there were 312 deaths, a mortality of 11.3 per cent. Deducting the moribund cases, or those dying within twenty-four hours after injection, the total mortality of all non-operative cases was 9.12 per cent.

Let us compare the results of intubation in cases in which the serum was used, with those obtained with this operation before the serum was introduced. Of 5546 intubation cases in the practice of 242 physicians, collected by McNaughton and Maddren (1892) the mortality was 69.5 per cent. Since that time statistics have improved materially by the general use (in and about New York, at least) of calomel fumigations. With this addition, the best results published (those of Brown) showed in 279 cases a mortality of 51.6 per cent.

Let us put beside the cases of McNaughton and Maddren the 533 intubations with antitoxin, with 25.9 per cent. mortality. With Brown's personal cases let us compare those of the fourteen observers who have reported to the Committee ten or more intubation operations in cases injected with serum. These comprise 280 cases with 65 deaths, a mortality of 23.2 per cent. In both comparisons the mortality without the serum is more than twice as great as in the cases in which serum was used.

The reports of some individual observers concerning intubation with the serum are interesting:

Neff, New York: 27 operations, with 27 recoveries.

Rosenthal, Philadelphia: 18 operations, with 16 recoveries.

Booker, Baltimore: 17 operations, with 17 recoveries, including one aged ten months, and one seven and a half months.

Seward, New York: 8 operations, with 8 recoveries.

McNaughton, Brooklyn: "In my last 72 operations without serum, mortality 66.6 per cent.; in my first 72 operations with serum, mortality 33.3 per cent."

O'Dwyer, New York: "In my last one hundred intubations, first 70, without serum, mortality 73 per cent.; last 30, with serum, mortality 33.3 per cent.

But even these figures do not adequately express the benefit of antitoxin in laryngeal cases. Witness the fact that over one-half the laryngeal cases did not require operation at all. Formerly ten per cent. of recoveries was the record for laryngeal cases not operated upon. Surely, if it does nothing else, the serum saves at least double the number of cases of laryngeal diphtheria that has been saved by any other method of treatment.

The great preponderance of intubation over tracheotomy operations shows how much more highly the profession in this country esteems the former operation.

A STUDY OF THE FATAL CASES.

Of the 450 fatal cases in the Committee's Report, 229, or one-half, received their first injection of the serum on or after the fourth day of the disease, and 152, or over one-third of these, on or after the fifth day.

There were 58 cases in which it was stated that the child was moribund at the time of injection, the serum being administered without the slightest expectation of benefit, but at the earnest solicitation of the parents.

There remain 350 cases in which the cause of death could be accurately determined by the reports. These died from the following causes, the most important cause being placed first:

Sepsis (including diphtheritic toxemia) was the cause of death in 105 cases; of which sixteen had nephritis, four were intubated or tracheotomized, two were laryngeal cases not operated upon, four had paralysis, one had pneumonia, and in one the fatal sepsis was attributed to a traumatic condition of the left knee.

Cardiac paralysis was the cause of death in 53 cases. Under this head are included cases of sudden heart failure occurring at the height of the disease (twenty-one in number) as well as those more commonly designated as heart paralysis, where death occurred suddenly after the throat cleared off. Of the latter there were thirty-two examples; four of these cases had throat paralysis, nineteen were septic, eight had nephritis, five were intubated, and one tracheotomized.

Broncho-pneumonia was put down as the cause of death in 54 cases. In 37 of these it followed laryngeal diphtheria; of these 22 were intubated, and four tracheotomized; two had nephritis; nine were septic. Broncho-pneumonia and sepsis was the cause of death in 10 cases, of which three had nephritis and one general paralysis. Broncho-pneumonia caused death in seven cases, apart from sepsis or laryngeal diphtheria; of these only one had nephritis; one died from heart failure; and in five pneumonia came on late in the disease.

Laryngeal diphtheria without operation caused death in 48 cases. In some of these the operation was refused by the parent, in others it was neglected by the physician, the patients dying of asphyxia; 3 of these cases had nephritis, 4 were septic, 2 had pneumonia, and 1 had sepsis and nephritis.

Diphtheritic tracheitis or bronchitis caused death in 11 cases; all of these were intubated, and in 2 there was evidence of the existence of membrane in the bronchi before operation. There were 33 other cases in which death followed laryngeal diphtheria without the supervention of pneumonia. It is highly probable that in some of these death was due to membranous tracheitis or bronchitis. All of them were operated upon; 10 were septic, 2 had paralysis, and 1 had nephritis.

Sudden obstruction of the intubation tube was the cause of death in 3 other laryngeal cases.

The tube was coughed up in 3 cases, fatal asphyxia occurring before the physician could be summoned.

Died on the table during tracheotomy, 1 case.

Nephritis was the cause of death in 15 cases; 7 of these were septic, and 3 had been intubated.

General Paralysis was the cause of death in 5 cases; in all probably the pneumogastric was involved.

Paralysis of the respiratory muscles produced death in 1 case, 1 of laryngeal diphtheria, which was intubated, and was complicated by broncho-pneumonia.

Measles associated with diphtheria produced death in six cases; 5 of these were laryngeal and were intubated; in 2 there was pneumonia, and in 2 sepsis. Diphtheria developed during the height of the measles, or immediately followed it.

Scarlet fever with diphtheria was the cause of death in 6 cases; in 3 of these there was broncho-pneumonia, nephritis, and sepsis; in 2 scarlet fever preceded diphtheria, and in 1 of these there was sepsis with gangrene of the tonsils. In

the sixth case the patient died of scarlet fever, which developed during convalescence from the diphtheria.

Gangrene of the cervical glands or cellular tissue of the neck was the cause of death in 2 cases associated with profound general sepsis.

Endocarditis caused death in 1 case, nineteen days after the diphtheria.

Diphtheritic inflammation of the tracheal wound with sepsis caused death in 1 case.

General tuberculosis, five weeks after diphtheria, was assigned as the cause of death in 1 case.

Exhaustion was the cause of death in 3 cases, 1 a protracted case; another complicated by pneumonia and sepsis; 1 by nephritis.

Convulsions was the cause of death in 3 cases apart from disease of the kidneys. In 1, the well-known Brooklyn case, the girl died ten minutes after the injection, in another, twenty-four hours after injection, in the third, the particulars were not given.

Meningitis was assigned as the cause of death in 1 case.

THE KIND OF ANTITOXIN USED.

They are given in the order of frequency with which they have been used. First, the serum prepared by the New York Board of Health; second, Behring's; third, Gibier's;[1] fourth, Mulford's; fifth, Aronson's; sixth, Roux's. In addition a large number of cases are reported as having been treated by the serum prepared by the health boards of different cities—Brooklyn, Newark, Rochester, Pittsburg, etc. The largest number of cases have been treated by the serum prepared by the New York Health Board, a very large number by Behring's serum, all others being relatively in small numbers.

Dosage and number of injections. In the great majority of cases but one injection is reported. In very severe ones two and three have been given. The largest amount is in a case by Weimer (Chicago) who gave eighteen injections of Behring's serum to a laryngeal case in a child thirteen years old. Another instance of ten injections is reported with no unfavorable symptoms.

As a rule the dosage has been smaller in antitoxin units than is now considered advisable, particularly in many of the laryngeal cases and others injected later than the second day.

[1] It is worthy of note that in the tests made by the State Board of Health of Massachusetts, published under date of April 6, 1896, this serum was found far below the standard as labeled upon the bottle; thus a package marked to contain 2500 units, by test was found to contain less than 700. All the other varieties of serum tested were found essentially up to the standard.

CASES INJECTED REASONABLY EARLY (DURING THE FIRST THREE DAYS) IN WHICH ANTITOXIN IS SAID TO HAVE PRODUCED NO EFFECT, THE DISEASE ENDING FATALLY.

These cases are nineteen in number. Brief reports are introduced that the reader may judge to what degree they may be regarded as a test of the serum treatment. In our statistical tables all of them have been included among the fatal cases.

In Cases I and II the cultures were reported negative. Case I, by Gallagher, New York: Child, eighteen months old; septic; although no eruption was present, the reporter was "inclined, on reflection, to regard this case as one of scarlatinal sore throat."

CASE II, by Potter, Buffalo: Male, fourteen months old; two cultures made, but no Loeffler bacilli found; membrane in the nose and pharynx. Injected on the third day, one dose of Behring's serum No. 1. No improvement; death from sepsis. "Probably pseudo-diphtheria" (I. H. P.).

In Cases III to IX no cultures were made.

CASE III, by Tefft, New Rochelle: Seven years old; injected after eighteen hours' illness; two injections of Behring's No. 2 serum; membrane on the tonsils, pharynx, and nose; no effect observed from injections; patient dying on the third day.

CASE IV, by Tefft: Male, four years old; membrane on the tonsils and pharynx; injected after thirty-six hours' illness with Behring's No. 2; died on the third day; no noticeable effect from the injection.

CASE V, by Tefft: Six years old; membrane on the tonsils, nose, and pharynx; septic; injected after thirty-six hours' illness; three injections of Behring's No. 2. "Saw no effect from the injections, the disease going steadily on to a fatal termination."

CASE VI, by Cameron, Montreal: Two and a half years old; fifty hours ill; membrane on the tonsils, nose, and pharynx; septic; no improvement noticed, and child died twenty hours after injection.

CASE VII, by Baker, Newtonville, Mass.: three years old; laryngeal diphtheria; injected on the third day 10 cc. Roux's serum; cyanosis; intubation; temperature 103° F., and continued high until death in eighteen hours after operation; injections had no effect.

CASE VIII, by Anderson, New York: Three years old; injected after three hours' illness; membrane on the tonsils, nose, and pharynx; one injection New York Health Board antitoxin. "A case of malignant diphtheria, full duration twenty-four hours."

CASE IX., by McLain, Washington: Four years old; twelve hours sick; membrane on the pharynx and larynx; two injections; no operation; first injection early in the morning, the other early in

the afternoon; died the same day; no change in the condition; antitoxin had no apparent effect.

In Cases X to XIII diphtheria complicated measles, all reported by W. T. Alexander, New York. Disease confined to the larynx in all; in three the stenosis developed during measles, and in one while the patient was convalescing from measles; diagnosis confirmed by culture in every case, and in all intubation performed. Antitoxin seemed to have no effect, the cases going on to a fatal termination; all received their injections within twenty-four hours after the laryngeal symptoms appeared.

In three cases—XIV to XVI—the type of the disease was malignant from the outset.

CASE XIV., by Lloyd, Philadelphia: Fifteen months old; injected after thirty-six hours' illness; diagnosis confirmed by culture; membrane covered the tonsils, pharynx, nose, and larynx; intubation; sepsis; death on the fifth day. Although antitoxin was used as promptly as possible no perceptible effect noticed. One injection, Behring's No. 3, was given.

CASE XV, by Wert, Mount Vernon, N. Y.: Eighteen months old; injected on the third day; diagnosis confirmed by culture; membrane on the tonsils and pharynx. "Very intense type of the disease." Antitoxin could not be procured before the third day; Gibier's serum used. "Died suddenly in apparent convulsions about ten hours after injection; urine not examined; very little passed."

CASE XVI, by Ingraham: Six years old; membrane covered the tonsils, pharynx, and larynx; diagnosis confirmed by culture; pneumonia present; condition very bad; injected after two and a half days' illness; three injections of Behring's serum; no benefit noticed.

CASE XVII, by Johnson, Buffalo: Three years old; twelve hours ill; case septic from the start; membrane on the tonsils, pharynx, and larynx; diagnosis confirmed by culture. "Antitoxin apparently had very little effect."

CASE XVIII, by Baker, Newtonville, Mass.: Two and a half years old; twenty hours ill; disease confined to larynx; diagnosis confirmed by culture; one injection of Gibier's serum; intubation. "Was doing well a few minutes before death when child got up in its crib, changed color and died almost immediately." Death attributed to "sudden heart failure; found no obstruction of the tube."

CASE XIX, by Story, Washington: Five years old; in fair condition; thirty-six hours ill; diagnosis confirmed by culture; membrane on the tonsils, pharynx, and larynx; one injection of United States Marine Hospital antitoxin; injection produced no effect.

CASES IN WHICH UNFAVORABLE SYMPTOMS WERE, MIGHT HAVE BEEN, AND WERE BELIEVED TO HAVE BEEN, DUE TO ANTITOXIN INJECTIONS.

Only three cases reported to the Committee could by any possibility be placed in this category. All of the details furnished by the reporters are reproduced:

CASE I, by Kortright, Brooklyn: Sudden death in convulsions ten minutes after injection. This case is the already well-known Valentine case, occurring in Brooklyn in the spring of 1895. The principal points were as follows: A girl sixteen years old; in good condition; tonsillar diphtheria; diagnosis confirmed by culture; injected on the first day with 10 cc. Behring's serum; died in convulsions ten minutes later.

CASE II, by Kerley, New York: Fairly healthy boy, two and one-half years old; membrane on tonsils, pharynx, and in nose. Diagnosis confirmed by culture; injected on the morning of the fourth day with 10 cc. (1000 units) New York Health Board serum; temperature at time of injection 100.4° F.; no sepsis, and child apparently not very sick; urine free from albumin. Distinctly worse after injection; in ten hours temperature rose to 103° F.; urine albuminous; throat cleared off rapidly, but marked prostration and great anemia, with irregular fluctuating temperature continued and death from exhaustion with heart failure four days after the use of the serum.

CASE III, by Eynon, New York: Male, three and one-half years old; diagnosis confirmed by culture; two days ill; membrane on tonsils and in nose; two injections New York Health Board serum. "A rapid nephritis developed after the second injection causing coma, convulsions, and death twenty hours after the second injection." In response to an inquiry for further particulars the following was received: "The case seemed a mild one, but the injection was given one afternoon and repeated the following afternoon, about 1500 units in all. The urine up to that time had not been examined. About fourteen or sixteen hours after the second injection unfavorable symptoms began to develop pointing to infection of the kidneys. The urine was found to be loaded with albumin. My impression at the time was that the antitoxin either produced, hastened, or intensified nephritis, thereby causing the fatal termination."

In regard to the three fatal cases just cited, Case I is wholly unexplained. In Case II, the query arises, did this sudden change hinge upon the injection of the serum, or was it one of those unexplained abrupt changes for the worse in a case apparently progressing favorably, so often observed in diphtheria? As regards Case III, it will be seen from the letter that the evidence is not at all conclusive. All details available are given, and the reader may draw his own conclusions.

CLINICAL COMMENTS.

The following are selected from hundreds which have been received, and may be taken fairly to

represent the sentiments of the physicians who have sent in reports:

Dr. Douglas H. Stewart, New York, sends reports of four cases, all desperate ones, and all "presumably fatal under any other form of treatment." Very extensive membrane in all; larynx involved in three; in one neglected case, in a child three years old, *injected upon the fifth day*, the membrane covered the tonsils, nose, pharynx, and larynx. Broncho-pneumonia, nephritis, and sepsis all present. Temperature 107° F. at the time of the first injection. Prostration so great that he dared not attempt intubation. Believes that this case would certainly have been fatal in a few hours without antitoxin. Perfect recovery.

In another case, three years old, membrane first discovered in the left ear; next morning, seen upon the tonsils, and spread in a few hours over the pharynx into the larynx and trachea. Intubation necessary in a few hours; had never seen membrane spread so rapidly as in this child. Urine albuminous; membrane subsequently expelled from larynx and trachea in large casts, with profuse bloody expectoration. Complete recovery on the ninth day. The physician describes this as "the very worst case of diphtheria that has ever come under my notice." Five thousand four hundred antitoxin units were given in four injections. He remarks: "My experiences in the past have been so very unfortunate that the advocates of antiseptics or therapeusis were a constant surarise to me. It has been my fate to have the most desperate cases unloaded upon my shoulders. I had been forced into the belief that the profession was absolutely powerless in the presence of true diphtheria; have lost case after case with tube in the larynx and calomel fumigations at work. Previous to antitoxin, my only hope had become centered in nature and stimulants. In two years have not lost a single case, and surely I may be pardoned if I suffer from diphtheria-phobia in a subacute form, and use antitoxin sometimes unnecessarily."

Dr. L. L. Danforth, New York, states that during his twenty-two years of practice in New York he has seen many fatal cases of diphtheria, had used all kinds of remedies, mainly those of the homeopathic school, and while he had as much confidence in the latter as in anything else, he had seen so many deaths during the year past that he "hailed with delight the advent of antitoxin, and determined to use it." Reports five cases, all of a severe type. "The result in every case has been marvelous. I would not dare to treat a case now without antitoxin."

Dr. H. W. Berg, New York, reporting 14 cases, says: "I have not yet ceased to be surprised at the recovery of some of these cases, which, in the light of my former experience with diphtheria treated without antitoxin, seemed to be irretrievably lost."

Dr. George McNaughton, Brooklyn, reports 72 laryngeal cases, with 24 deaths; 67 of these were intubated, with 21 deaths. He states that he has kept no records of cases other than laryngeal ones, as these seemed the best test of the serum treatment. He believes that if the serum is used early very many cases will not need operation for the relief of stenosis. "I would urge the use of antitoxin in all cases of croup in any patient who has an exudation upon the pharynx; would not wait for bacteriological confirmation of diagnosis, for in so doing valuable time is lost." Has noticed that the tube is coughed up more frequently in injected cases, and believed this due to the fact that the swelling of the tissues subsides at an earlier date.

Dr. D. C. Moriarta, Saratoga, reporting 4 cases, says that the first was a malignant one and "I only used the remedy because I am Health Officer and was urged to do so, as the type of the disease was that from which I have seen recovery but once in eleven years." Boy five years old, four days ill when injected; great prostration, rapid breathing, and he was "practically gone." Nares filled and tonsils and pharynx covered; severe nasal hemorrhage; cervical glands greatly swollen; heart's action very frequent and feeble; child unable to lie down. Behring serum 20 cc. injected; in six hours evidently more comfortable; in eighteen hours decidedly improved; in twenty-four hours sitting up and feeling much better; in forty-eight hours all urgent symptoms gone and membrane loosening. Subsequently had nephritis which lasted six weeks, and multiple neuritis which persisted for three months, but ultimately recovered perfectly. "I send this report because it converted me. No unbiased person familiar with diphtheria could see such results as this and not feel there must be good in it."

Dr. F. M. Crandall, New York, sends report of a child seven years old. Membrane on the tonsils and in larynx, with croup for forty hours when antitoxin was injected and intubation done. Progress of the disease had been rapid; semi-stupor and eyes half open; very feeble rapid pulse; intense toxemia; general cyanosis. Both cyanosis and dyspnea persisted after intubation, showing clearly the presence of membrane below the tube. Case regarded as "absolutely hopeless." The first change was seen in the disappearance of the toxemia, with improvement in the pulse, clearness of the mind, etc.; later a change in the local condition; large masses of membrane were expelled from the larynx and trachea, necessitating frequent removals of the tube. Tube finally removed in a week with complete recovery.

Dr. Reynolds, Baltimore, mentions a case showing the danger of relying too implicitly upon the bacteriological diagnosis. Male, three years. Culture reported only staphylococcus and streptococcus, consequently injection delayed until the fifth day, when membrane covered tonsils, nose, and pharynx. Child died two days later. A sister subsequently contracted the disease, received an-

titoxin on the third day and recovered. The reporter would not wholly rely upon the culture test for diagnosis.

SUMMARY.

1. The report includes returns from 615 physicians. Of this number more than 600 have pronounced themselves as strongly in favor of the serum treatment, the great majority being enthusiastic in its advocacy.

2. The cases included have been drawn from localities widely separated from each other, so that any peculiarity of local conditions to which might be ascribed the favorable reports must be excluded.

3. The report includes the record of every case returned except those in which the evidence of diphtheria was clearly questionable. It will be noted that doubtful cases which recovered have been excluded, while doubtful cases which were fatal have been included.

4. No new cases of sudden death immediately after injection have been returned.

5. The number of cases injected reasonably early in which the serum appeared not to influence the progress of the disease was but 19, these being made up of 9 cases of somewhat doubtful diagnosis; 4 cases of diphtheria complicating measles, and 3 malignant cases in which the progress was so rapid that the cases had passed beyond any reasonable prospect of recovery before the serum was used. In two of these the serum was of uncertain strength and of doubtful value.

6. The number of cases in which the patients appeared to have been made worse by serum were three, and among these there is only one new case in which the result may fairly be attributed to the injection.

7. The general mortality in the 5794 cases reported was 12.3 per cent.; excluding the cases moribund at the time of injection or dying within twenty-four hours, it was 8.8 per cent.

8. The most striking improvement was seen in the cases injected during the first three days. Of 4120 such cases the mortality was 7.3 per cent.; excluding cases moribund at the time of injection or dying within twenty-four hours, it was 4.8 per cent.

9. The mortality of 1448 cases injected on or after the fourth day was 27 per cent.

10. The most convincing argument, and to the minds of the committee an absolutely unanswerable one, in favor of serumtherapy is found in the results obtained in the 1256 laryngeal cases (membranous croup). In one-half of these recovery took place without operation, in a large proportion of which the symptoms of stenosis were severe. Of the 533 cases in which intubation was performed the mortality was 25.9 per cent., or less than half as great as has ever been reported by any other method of treatment.

11. The proportion of cases of broncho-pneumonia—5.9 per cent.—is very small and in striking contrast to results published from hospital sources.

12. As against the two or three instances in which the serum is believed to have acted unfavorably upon the heart might be cited a large number in which there was a distinct improvement in the heart's action after the serum was injected.

13. There is very little, if any, evidence to show that nephritis was caused in any case by the injection of serum. The number of cases of genuine nephritis is remarkably small, the deaths from that source numbering but fifteen.

14. The effect of the serum on the nervous system is less marked than upon any other part of the body; paralytic sequelæ being recorded in 9.7 per cent. of the cases, the reports going to show that the protection afforded by the serum is not great unless injections are made very early.

The Committee feels that this has been such a responsible task that it has thought best to state the principle which has guided it in making up the returns. While it has endeavored to present the favorable results with judicial fairness, it has also tried to give equal or even greater prominence to cases unfavorable to antitoxin.

In conclusion the committee desires in behalf of the Society to express its thanks to members of the profession who have coöperated so actively in this investigation, and to Dr. A. R. Guerard for the preparation of the statistical tables.

(Signed)

L. EMMETT HOLT, M. D.,
W. P. NORTHRUP, M. D.,
JOSEPH O'DWYER, M. D.,
SAMUEL S. ADAMS, M. D.,
} Committee.

THE ACTION OF THE SOCIETY UPON THE REPORT.

At the close of its presentation, the Society voted to accept the report of the Committee and after a full discussion it was decided to embody its conclusions in the following resolutions:

1. *Dosage.* For a child over two years old, the dosage of antitoxin should be in all laryngeal cases with stenosis, and in all other severe cases, 1500 to 2000 units for the first injection, to be repeated in from eighteen to twenty-four hours if there is no improvement; a third dose after a sim-

ilar interval if necessary. For severe cases in children under two years, and for mild cases over that age the initial dose should be 1000 units, to be repeated as above if necessary; a second dose is not usually required. The dosage should always be estimated in antitoxin units and not of the amount of serum.

2. *Quality of Antitoxin.* The most concentrated strength of an absolutely reliable preparation.

3. *Time of administration.* Antitoxin should be administered as early as possible on a clinical diagnosis, not waiting for a bacteriological culture. However late the first observation is made, an injection should be given unless the progress of the case is favorable and satisfactory.

The Committee was appointed to continue its work for another year and was requested to issue another circular asking for the further coöperation of the profession, this circular to be sent out as soon as possible in order that physicians may record their cases as they occur through the coming year.

CLINICAL MEMORANDUM.

A CASE OF EPILEPSY AND MIGRAINE, APPARENTLY DEPENDING UPON EYE-STRAIN.[1]

By F. W. MARLOW, M.D.,
OF SYRACUSE, N. Y.
PROFESSOR OF OPHTHALMOLOGY IN THE MEDICAL DEPARTMENT OF SYRACUSE UNIVERSITY.

ALTHOUGH it has been asserted by some writers that epilepsy and migraine do not occur in the same individual, a number of cases has been recorded which prove the reverse to be true in exceptional cases. Liveing[2] records in detail some interesting cases of this kind. In these, for the most part, the attacks commenced and continued for years as attacks of sick headache, afterward becoming epileptic in character; or attacks of epilepsy alternated with attacks of sick headache.

Gowers,[3] also, states that he has seen twelve cases in which both affections occurred in the same individual. In seven migraine had existed for several years, and the patients afterward became epileptic. In five of these seven the migraine ceased, or diminished greatly, when the epilepsy developed. In the five remaining cases the attacks were sometimes epileptic and sometimes migrainous in character. I have myself in three cases noted the occurrence of both maladies in the same patient.

One of Liveing's cases is sufficiently suggestive of the present one to justify the repetition of it here briefly. A girl, eighteen years old, complained of a peculiar kind of headache, from which she had suffered eighteen months; previously feels unwell and depressed, then has a sense of oppression in region of heart, then becomes momentarily confused and speechless. It does not appear that consciousness is lost, as she remembers what is said at the time. Sometimes there are no premonitory symptoms. These symptoms are now invariably followed by a severe frontal headache, terminating in a heavy sleep of three or four hours' duration. Sometimes two attacks occur in a day. Once the headache was absent, but the sleep occurred as usual.

Olmerod says that a patient described to him attacks commencing with symptoms of sick headache and ending with an epileptic seizure.

The patient, an unmarried woman, aged thirty years, was first seen by me on October 10, 1890. She had been subject to what she called a common sick headache from early childhood, occurring perhaps once or twice a year, but at about fourteen years of age became subject to a much severer type of headache, occurring twice or three times a week during the whole period of time she was subject to it, with the exception of one interval of seven weeks. The ordinary duration was from twenty-four to thirty-six hours, but some attacks lasted three days. As a rule, there was no warning or premonitory symptoms, but occasionally for an hour or two before pain commenced there was a "strange, tight feeling," in the top of the head, and so much dizziness that she couldn't walk. The pain was situated between the eyes and in the back of the head, was most intense in character, and was accompanied from the start or within two hours of it, by constant nausea and uncontrollable vomiting. Latterly she had in some attacks, in her own words, a "sort of spasm in which I would set my eyes and straighten back, and know nothing for perhaps five minutes." For the pain and vomiting ether and chloroform were commonly administered, and sometimes morphin subcutaneously.

There was no difficulty in finding the right words, or in thinking; but the feeling of sickness was so great that it was an effort to speak. Her tongue and arms got very numb during the attack and sometimes her legs also. No loss of memory followed the attacks; on the contrary she never felt brighter than immediately after one. The attacks commenced either during the day or night, with a tendency latterly to begin in the daytime. There was no drowsiness during the attack, and even the subcutaneous injection of morphin failed to produce sleep. After the headache was over she commonly slept for a short time.

Her father used to have very severe headaches until he partially lost the sight of one eye twelve years ago, since which time the severe headaches have not occurred. An aunt, also, was subject to sick headaches and died suddenly in a nervous seizure of some kind.

It will hardly be denied that the diagnosis of an unusually severe type of sick headache was completely warranted by the symptoms, which may be briefly summarized as follows: Periodic headaches accompanied by nausea and vomiting, and with numbness of tongue and extremities, commencing in early childhood, and occurring in a patient with a family history of sick headaches. That, at any rate, was my diagnosis at the time, and remained so until recently, when the description of an attack by an eye-witness caused me to modify it.

[1] Reported before the Syracuse Academy of Medicine.
[2] "Treatise on Megrim and Sick Headache."
[3] "Diseases of the Nervous System."

In one attack seen, the patient dropped suddenly and without warning from the chair in which she was sitting, in a completely unconscious state, became rigid, arms and legs stiffening out, frothed at the mouth, and there were some slight convulsive movements. The unconsciousness lasted two hours, and was immediately followed by severe nausea and intense headache.

On another occasion the attack came on while on the cars, and just as she was about to pass out through the doorway. In falling she grasped the handle of the door, which she held in so rigid a spasm that it was only disengaged with great force. It required three men to get her out of the train, and she was ill with headache and vomiting for three days afterward.

It became evident therefore, that whatever name might be given to the termination of the attack, the onset consisted of a typical epileptic seizure.

It is scarcely necessary to state that every physician, regular and otherwise, in the neighborhood of her home had been consulted, but without benefit. From the age fifteen to eighteen years there was a complete suppression of menstruation, to which the attacks were at that time attributed. A five month's residence and treatment in the private hospital of a New York gynecologist resulted in a restoration of this function, but made no difference whatever to the frequency or severity of the so-called headaches. She was treated also in other cities, but without benefit. It was, therefore, with but little expectation of relief that she acted upon the suggestion of a friend, and had her eyes examined.

She has always been in the habit when reading of looking sideways, turning the eyes to the left, and also suffered from some twitching of the right eyelid and side of nose, and has a tendency to hold objects very near, although her distant vision is good.

Examination shows

R. V. $\frac{6}{6}$; + 0.25 D. cyl. ax. 60° improves.
L. V. $\frac{6}{12}$; + 0.75 D. cyl. ax. 100° improves.

Tests for muscular equilibrium shows practical orthophoria.

After homatropia:

R.V. $\frac{6}{12}$; + 1.25 D. S. ⊃ + 0.25 D. cyl. ax. 60° = $\frac{6}{6}$-
L.V. $\frac{6}{12}$; + 0.50 D. S. ⊃ + 0.75 D. cyl. ax. 100° = $\frac{6}{6}$-

Prescribed for constant wear:

R. + 1. D. S. ⊃ + 0.25 D. cyl. ax. 60°.
L. + 0.25 D. S. ⊃ + 0.75 D. cyl. ax. 100°.

Five years and a half have now elapsed and she has had no recurrence of the attacks, and has had no other treatment. Within six months of the time she commenced to wear glasses she had gained twenty pounds in weight.

This case brings up the question of the difference between *idiopathic* and so-called *reflex* epilepsy. We know epilepsy only by its history and symptoms; of its pathology nothing is known. All statements regarding it are hypothetical or conjectural. It is generally admitted by writers on the subject that the symptoms of the idiopathic are indistinguishable from those of the so-called reflex form. It is also admitted that convulsions due in the first place to the irritation of intestinal worms, may continue after the worms are discharged as idiopathic epilepsy. Furthermore, the peripheral source of the so-called reflex attack may be extremely difficult to discover. This being doubtlessly true, it will not be denied that the peripheral source is sometimes not found at all, though it exists, and that the failure to discover it in any case is not a proof of its non-existence. We also find the assertion under the heading of prognosis that reflex epilepsy may be cured by the removal of its peripheral source of irritation, whereas the cure of a case of idiopathic epilepsy is most exceedingly rare. All of which amounts to this, that so long as epileptic attacks remain unchecked by the removal of the peripheral irritation or strain upon which they depend they are to be considered idiopathic in character, but as soon as the removal of this strain prevents the recurrence of the attacks, they are to be classed in the far less serious and important category of reflex convulsions. It is easy to understand on this very simple method of classification, why idiopathic epilepsy is so very rarely amenable to treatment. It doubtless resembles other functional disturbances, in not ceasing until its cause is removed.

The present case bears strongly on this point. It presents many—all the necessary characteristics of the idiopathic disease. Occurring in a patient with a family history of sick headache, possibly of epilepsy, commencing early in life, replacing attacks of ordinary cephalalgia the attacks being absolutely sudden in their onset, with total unconsciousness and convulsions, terminating in an attack of typical sick headache, commencing sometimes in the night and sometimes in the day, and occurring at short intervals for a period of sixteen years, during which time she was treated by many physicians in her own neighborhood and elsewhere without any relief, it is hardly likely that any of these physicians would have hesitated to declare it a case of true idiopathic epilepsy.

From the standpoint of history, symptoms, and associations, this was a case of idiopathic epilepsy; from the standpoint of its cure, a case of reflex epilepsy.

It emphasizes the importance of removing all sources of peripheral irritation or strain, even when all indications are in favor of the case being idiopathic in nature.

MEDICAL PROGRESS.

The State of the Blood Attending Metastatic Carcinosis of the Bone-Marrow.—EPSTEIN (*Zeitschrift für klinische Medicin*, B. 30, H. 1, 2, p. 121) has reported the case of a woman, without hereditary predisposition, who complained of pain in the right lower extremity, and especially referred to the femur. The patient was languid and emaciated, although the appetite was preserved. From time to time there was vomiting, and there was increased thirst. Following a tepid bath hematemesis occurred, and the stools contained coffee-ground like material. Subsequently nose-bleed occurred frequently. The skin and mucous membranes were waxy-yellow in appearance. The pulse and respiration were accelerated, although temperature was slightly below normal. The

lymphatic glands at the left angle of the lower jaw and at the flexures of the elbows and groins were enlarged, hard, and movable. Each breast contained a firm nodule, and the nipple was retracted. The percussion-note at the apices of the lungs, and over the remaining anterior portion, was hyper-resonant upon the right, but upon the left the resonance was impaired. Upon the right the breathing was vesicular and upon the left harsh. At the apex of the heart a systolic murmur was audible, increasing in intensity in the direction of the pulmonary artery. The stomach was displaced downward. The area of hepatic percussion dulness was slightly increased. The lower extremity of the spleen was palpable. The urine was passed in diminished quantities, but presented no other abnormality. The uterus was dragged to the right and backward and was retroverted. The right lower extremity was painful and flexed at the knee-joint. In the progress of the case the pulmonary percussion dulness was increased over the whole left chest, and fine moist râles were heard. Over the heart systolic and diastolic friction murmurs became audible. A purulent discharge took place from the left ear. The patient grew gradually weaker and finally died in collapse. Upon *post-mortem* examination cirrhosis carcinoma of the left breast was found, with metastases in the right breast, in the axillary, cervical and mediastinal glands, in both tonsils, in the lymphatics of the pleura, in the gastric mucosa, in the dura mater, and in the left mastoid process; as well as in the bone-marrow of all the bones examined. The blood contained only nineteen per cent. of hemoglobin. Exact estimations of the number of corpuscles could not be made, but a study of cover-glass preparations disclosed a high degree of oligocythemia. The red blood-corpuscles were very variable in size and many were nucleated; some of the nuclei had evidently undergone fragmentation. The red cells, and especially the nucleated ones, were distinctly polychromatophilous. The proportion of red to colorless corpuscles varied from one to twenty-five, and one to forty. The increase in the number of the colorless cells involved especially the large mono-nucleas form, the majority of which presented netrophule granulations. Cells resembling myelocytes were also found. But two eosinophil cells were found.

Active and Passive Immunity to Cholera, Typhoid Fever, and Allied Disease-Processes.—PFEIFFER (*Deutsche medicinische Wochenschrift*, 1896, No. 15, p. 232), formulates in the following propositions the results of his investigations upon the subject of immunity: The cholera poison is contained in the body-substance of the cholera-vibrio, so that dead, as well as living cholera bacilli show marked toxic properties. The cholera poison becomes capable of absorption by the disintegration of the cholera bacteria; analogous conditions have been established as regards typhoid fever, anthrax, chicken cholera, staphylococcus infection, and apparently influenza. Animals may be rendered immune to toxic doses of living cholera spirilla, and typhoid bacilli by previous treatment with various substances of bacterial and non-bacterial origin. This protection is transient, and does not depend upon specific changes in the fluids of the body, and is designated as resistance, in contradistinction to specific immunity. In the blood-serum of human beings and animals that have been exposed to the action of living or dead cholera spirilla or typhoid bacilli, there occur specific protective bodies, which are thus capable of rendering aid in differential diagnosis in cases in which ordinary methods have failed; and these substances may be made to accumulate in the blood in concentrated degree by properly conducted immunization. In their relation to chemic and physical agencies, they bear a close analogy with the antitoxins, from which, however, they are differentiated by their action. While the antitoxins occupy a specific relation to certain poisons, and are capable of destroying these in the animal body, the anti-bodies of cholera and typhoid fever are incapable of thus acting upon the poison of typhoid bacilli and cholera spirilla. Their activity consists in the destruction of the bacteria, but this property makes itself manifest, as a rule, only in the body, and is capable of demonstration outside the body only under special circumstances. These anti-bodies are also found, though in small quantities, in the normal blood of animals and human beings. They are neither bacterial products deprived of virulence, nor combinations of these with components of the immunized organism, but they are probably entirely new substances resulting from the specific reaction of the body to a specific irritant. The evidence points to the view that the anti-bodies are specific ferments. It is possible that the antitoxins also are specific enzymes. As fermentative activity plays an important part in the production of natural immunity, it is possible to relate natural and acquired immunity, antitoxic and bactericidal functions to a common general principle.

Post-diphtheritic Paralysis a Month after Serum Treatment.—FILLIATRE (*Gazette Hebdomadaire de Médicine de Chirurgie*, 1896, No. 33, p. 385) has reported the case of a child, nearly three years old, presenting symptoms of croup, which proved on bacteriologic examination to be diphtheritic. An injection of fifteen c.cm. of antitoxic serum was at once made into the right flank, and forty-eight hours later a second injection of ten c.cm. into the left flank. In the course of twelve hours, the false membrane had completely disappeared, the child breathed easier, the pulse was normal, the fever had disappeared, and only the sub-maxillary adenopathy remained. The child continued well for more than a month, when it was observed to speak through the nose. A day later, speech was almost unintelligible, and saliva dribbled from the mouth. In the course of several days more, the head could not be held up, the chin falling upon the chest. Deglutition also became difficult. The knee-jerks as well as the pupillary reflexes, were preserved. Sensibility was intact. The muscles, especially enfeebled, were the extensors of the neck, the rotators of the head, excepting the sterno-mastoid, the supra-spinous, and the elevators and abductors of the scapulæ. The fascial muscles also were largely affected, as well as the recti abdominis. Under electric treatment, improvement rapidly set in, and soon proceeded to final recovery.

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SATURDAY, JULY 4, 1896.

ANTITOXIN IN DIPHTHERIA; THE COLLECTIVE INVESTIGATION.

THE AMERICAN PEDIATRIC SOCIETY'S REPORT, the full text of which appears in this issue of the NEWS, is worthy of the careful perusal of every physician interested in the subject of diphtheria. It is the first time that an investigation has been attempted on such an extensive scale of cases drawn exclusively from private practice, and forms a fitting conclusion to the antitoxin discussion which has been going on in our journal for the past few weeks.

Statistical evidence may be worth much or little according to the purpose with which it has been gathered. Its value depends mainly upon four factors: the number of cases; the conditions under which they have been observed; the accuracy with which they have been reported; and the care and honesty with which they have been analyzed. Let us look at the Society's Report with these points in mind.

While a report of fifty or a hundred cases is of value and may be convincing to the mind of the physician who has observed them, they are not conclusive. To establish any point in a disease like diphtheria, the figures must be large enough to include groups, not only of mild but of severe cases, or, in other words, large enough to represent all the variations of the disease. The number of cases in the report—nearly six thousand—is great enough to warrant some positive deductions. That the Committee were able to secure so large a number of cases is indeed surprising, and cannot fail to show how strong a position antitoxin already has in the judgment of the physicians of this country.

In an acute disease, cases observed under special conditions are not to be depended upon to determine the value of any mode of treatment, *e.g.*, statistics taken exclusively from hospital practice, those of cases of a certain age, or from a single locality, or from one epidemic, do not represent the facts of a disease so well as when they are drawn from widely-scattered districts and are observed under varying conditions. Reports from 114 cities and towns are much more valuable for evidence than if all the cases had been treated in New York or Philadelphia, where the special characteristics of the local epidemic would need to be taken into account. In the recent discussions of diphtheria in New York, the results obtained in the Willard Parker Hospital have figured altogether too prominently. The number of cases treated there is not large, and the conditions are somewhat peculiar. Moreover, the present results are useful only for comparison with previous years, and are in no sense to be compared in importance with the results obtained with antitoxin in the wide field of general practice. The Committee has endeavored to reach as large a number as possible of physicians who have used antitoxin, and has succeeded in obtaining reports from over six hundred. Of this number, almost all have recorded themselves as strongly in favor of the antitoxin treatment. A general conclusion reached by so many physicians carries great weight—much more weight than would the same number of cases treated by a score of physicians. The report may thus be taken as a vote upon the value of antitoxin by over six hundred American physicians.

As an example of a faulty mode of collecting cases, let the reader study the paper of Dr.

Stowell in the MEDICAL NEWS of June 20th or the New York *Medical Record* of same date, where the purpose of the writer has apparently been to collect from medical literature all the reports possible in which there was a low mortality. Such a collection of cases proves nothing even though they aggregate thousands except, perhaps, that diphtheria is sometimes mild, as we all know. Such tables represent a very favorable, but a very fallacious, showing, and are entirely without value in determining what the mortality of diphtheria really is.

Any set of figures may be twisted, as everyone knows, to prove propositions which are diametrically opposed to each other, according to the bias of the person who analyzes them. The work of the Committee in this respect is a model of fairness and justice. That the facts reported have been presented without prejudice is, we think, evident upon every page. The position taken by the Committee in excluding mild cases not confirmed by bacteriological examination is a very proper one, although by this fact the percentage of mortality has certainly been raised; while, by including doubtful cases which terminated unfavorably, the report obviates the criticism of having excluded any evidence unfavorable to antitoxin.

The general result of the analysis of these cases is decidedly favorable to the antitoxin treatment, and the report as a whole is, we think, the strongest evidence which has yet been brought forward. Let us look at a few points in detail: First, the results obtained in cases under two years. It is well known that the mortality of such cases is always high, whether observed in private or public practice. That 867 cases were treated, with a mortality of only 23.3 per cent., is a remarkable showing; or, excluding moribund cases, 19.2 per cent. Again, a mortality of 25.9 per cent. in 533 cases of laryngeal diphtheria requiring intubation, is a record which has never been approached. Whatever may be said of the results obtained in pharyngeal diphtheria, and low mortality figures have been published by many other methods of treatment, we think the committee is right in stating that it is by the results in the laryngeal cases that the real value of antitoxin is to be tested. Upon this point the evidence of the report in favor of antitoxin seems to be conclusive.

So much has been said in hospital reports concerning the frequency of broncho-pneumonia following antitoxin, that we look with special interest to see what the report has to say concerning this complication. The percentage of broncho-pneumonia (5.9) is remarkably small, and it is still more remarkable that broncho-pneumonia was ascribed as the cause of death in only about one-seventh of the fatal cases. This is in strong contrast with hospital results, and points to the fact that it is "hospitalism," and not antitoxin, which is responsible for the prevalence of the pneumonia.

It is to be regretted that the reports sent in to the Committee did not furnish fuller details regarding nephritis. Examinations of the urine are so frequently neglected in private practice that the data on this subject were quite imperfect. Whatever the frequency of nephritis may have been in the cases, there were only fifteen in which this was assigned as the cause of death—a very small proportion, as compared with general results.

The profession certainly owes the Society and the Committee a debt of gratitude for having collected such a mass of data relating to the treatment of diphtheria. It has been patiently awaiting a fair statement of all the facts, not one side of the question, and in this report we think all the facts have been fairly presented. We are glad to note that the work of the Committee is to be continued for another year.

THE PRESENCE OF THE LEPRA-BACILLI IN THE MEDULLA OF A FATAL CASE OF SYRINGOMYELIA.

IT has been contended by some observers that the symptoms included in the designation syringomyelia is really but a manifestation of leprosy, and it must be admitted that there is, at times, a considerable resemblance between the two sets of phenomena. There is, however, abundant clinical evidence that the two morbid processes are distinct, although in one case of syringomyelia lepra-bacilli were found in some of the peripheral nerves. PESTANA and BETTENCOURT (*Centralblatt für Bakteriologie, Parasitenk. u. Infektionskrankh.*, B. XIX, Nos. 18, 19, p. 698) now re-

ports a case of syringomyelia in which, with characteristic phenomena, lepra-bacilli were found at the site of the lesion in the medulla oblongata. The patient was a man forty-six years old, without hereditary predisposition, in whom symptoms of syringomyelia had been present for three years. At first there had been weakness of the left arm, with increasing intensity, followed a year later by similar weakness in the right arm. In the meantime it was noticed that contact with hot bodies was unattended with discomfort. Examination showed that the upper extremities were insensitive to heat and cold, and in less degree to touch. Later weakness appeared also in the lower extremities, and the muscles first affected began to undergo atrophy. Tactile and thermic insensibility increased in degree and extent, involving, however, principally the right side, and painful sensibility also became diminished and in places lost. The wasting and the weakness, with fibrillary contractions, were, on the other hand, the more marked upon the left side. The case thus progressed to a fatal termination. Upon *post-mortem* examination the cord was found enlarged in the cervical region in consequence of the presence of a dark-gray mass—which proved to be gliomatous—and in the midst of which excavation had taken place. The disease extended from the cervical enlargement to the medulla and had given rise to inflammatory and degenerative changes in adjacent portions of the cord. Bacterioscopic examination of sections of the affected medulla disclosed the presence of numerous lepra-bacilli.

OPHTHALMOLOGY.

A CRITICAL RESUME OF RECENT PROGRESS.

EXPERIMENTS with the Röntgen rays have been conducted in relation to nearly all of the special branches of medicine, including ophthalmology. While no brilliant beneficial results have been arrived at, and it is not expected that the Röntgen rays will confer much benefit on suffering humanity when applied to ophthalmology, the experiments have developed certain facts which are of interest to those who are working in this particular branch of medicine.

Dr. Van Duyse (*Arch. d'Ophthalmologie*, February, 1896) experimented with rabbits' eyes, introducing pieces of lead into the anterior segment of the globe, and obtained skiagraphs by placing a sensitized plate below the head and projecting the X-rays from the Crookes' tube from above, giving an exposure of twelve minutes. The location of the foreign body could be readily determined by this means. Van Duyse is of the opinion that this procedure may be of value when the piece of metal is lodged in the anterior segment of the human eye. He suggests, however, that the cryptoscope of E. Salviani or fluoroscope of Edison may be utilized for the purpose of locating a foreign body, making it unnecessary to obtain a shadowgraph. Exposures of the human eye are made by Van Duyse by placing the plate as far back at the inner canthus as possible, projecting the X-rays from the temporal side. In order to produce marked prophthalmus he suggests injecting sterile, normal saline solution into Tenon's capsule, causing the solution to pass behind the globe and to push the globe forward.

Dr. F. C. Harousch (*Annal. of Ophthal. and Otol.*, vol. v, p. 267) has made a number of experiments with the X-rays on pigs', calves', and lambs' eyes, with and without the introduction of metallic foreign bodies. The time of exposure was forty-five to fifty minutes. Where satisfactory exposures could be obtained, the position of metal foreign bodies in the eyes could be readily determined. An interesting point observed was the relative resistance of the various parts of the eye to the Röntgen rays. The obstruction offered to the rays increased in the following order: (1) Capsule of lens. (2) Choroid and retina. (3) Sclerotic. (4) Cornea. (5) Vitreous body. (6) Lens. Knowing that the X-rays produce no sensation of vision when they reach the retina through the cornea, lens, and vitreous, experiments were made to determine the effect of the X-rays on the retina when passed through the sclera and choroid. No sensation of light was produced. An attempt was made to locate a piece of steel in the interior of an eye, which had entered the eye eight weeks before the patient came under observation. Iridocyclitis was present. A ciliary staphyloma, 2 mm. in diameter, was observed situated 6 mm. above the margin of the cornea; vitreous hazy; no

foreign body could be seen. A skiagraph of the anterior segment of the globe was obtained by placing the sensitive photographic plate on the temporal side, and projecting the X-rays over the bridge of the nose. A dark line was seen in the negative which was thought to represent the shadow from the foreign body, situated near the base of the staphyloma, but on making an incision into the globe at the point indicated no foreign body was found.

The experiments briefly referred to above have developed the fact which is of scientific interest, that the transparent media of the eye offer obstruction to the passage of the X-rays similar to that of glass. The fact is also demonstrated that the Röntgen rays have a very limited application in ophthalmology.

The treatment of diphtheritic affections of the eye, by the use of the Roux-Behring antitoxin, has excited no little interest in France, England, and Germany, very gratifying results having been reported. Diphtheria of the conjunctiva is of relatively rare occurrence in the United States; however, it does occur, and is so rapidly destructive to vision that it is important to know that we possess a remedy potent in arresting its ravages. Coppez has contributed two articles on the subject (*Jour. de Med. et de Chir. de Brux.*, November 24, 1894, and *Rev. Gen. d'Ophthal.*, 1896, p. 51). The first case reported occurred in a child of nineteen months. Loeffler's bacillus was demonstrated by culture methods. At the time the injection was made the conjunctivæ of the lids of both eyes were covered with pseudo-membrane, and the corneæ were hazy. An injection of 10 c.cm., 1600 units Behring, was given. In forty-eight hours the membrane had disappeared. The child made a good recovery. In a second case, occurring in a child of sixteen months, the false membrane was present on the conjunctiva of one eye only. The Loeffler bacilli were present. Ulcer of the cornea developed on the day after the injection was made. The membrane was gone on the fourth day. The corneal ulcer healed, having done but little damage to the cornea. No membrane developed on the conjunctiva of the fellow eye. Coppez attributes the non-appearance of pseudo-membrane on the conjunctiva of one eye to the prophylactic effect of the antitoxin. Hamilton and Emery (*Br. Med. Jour.*, 1895, p. 1419) report a case of diphtheria of the conjunctiva following scarlatina and accompanied by faucial diphtheria. Both eyes were affected; ulcer of the cornea of one eye. Two injections, each of 10 c.cm. of antitoxin, were given in the first twenty-four hours. Improvement began almost immediately. Four days later a third injection was given as pseudo-membrane had again appeared in the throat. There was perforation of the right cornea, but recovery with good vision occurred. Schmidt-Rimpler (*Centralbl. f. p. Augenheilk.*, 1895, p. 353) reports the treatment of three cases of post-diphtheritic paralysis of the accommodation, treated by injections of antitoxin, and states that in his opinion recovery took place much more rapidly than would have been the case if the antitoxin had not been employed. Favorable reports of the effect of serumtherapy in diphtheria of the eye have also been made by Morax, Konigshofer, Recken, Darier, and others. The results obtained were good in all cases reported.

Of the remedies that have recently attracted attention in ophthalmological therapeutics, formic aldehyde is probably the most important. The preparation used is that known as formalin. It is a forty per cent. solution of formic aldehyde. The solutions mentioned below are dilutions of formalin. Guaita (*Ann. d'Ottal.*, v. xxiii, p. 360) was one of the first to exploit the excellencies of this remedy in ophthalmic practice. The immediate germicidal power of formic aldehyde is much inferior to solutions of the sublimate of similar strength, but its great diffusibility, due to the absence of any tendency to coagulate albumin, renders it of greater value as an antiseptic. Cutting instruments are not affected by it. Guaita found formalin of value in the treatment of corneal ulcers, infected wounds, purulent and mucopurulent conjunctivitis, and trachoma. He employed a solution of 1–100 to touch the corneal ulcer, and gave a solution of 1–2000 to be used as a collyrium every four hours. Formalin in solution of 1–1000 or less is somewhat irritating to the conjunctiva, but in solution of 1–2000 it produces no unpleasant sensation; in this strength the remedy is harmless. Valude (*Recueil d'Ophthal.*, 1893, p. 431) substantiates the claims regarding the value of formic aldehyde as

set forth by Guaita, he has found it efficacious in post-operative infection, instilling a solution of 1–1000 into the eye every three hours. Davidson *Br. Med. Jour.*, 1896, p. 144) uses a solution of formalin (Schering) 1–2000 to 1–3000, directing that it shall be dropped into the eye freely every hour—a virtual lavage of the eye. Employed in this way it has proven to be of great value in cases of infected corneal ulcer, with or without hypopion. One of the cases reported by Davidson is briefly as follows: Prolapse of the iris accompanying a perforating lacerated wound of the cornea, in its lower half, incurred four days previously. Status praesens: Infiltration of corneal tissue adjacent to the wound; hypopion; iritis. Treatment: atropin, one per cent. instilled two or three times daily. Eight or ten drops of a 1–2000 solution of formalin was dropped into the eye every hour when the patient was awake. When seen the next day the cornea was clear, hypopion gone, iris fairly well dilated, no pain. Burnett (*Ophthalmic Record*, 1896, p. 310) has met with much success in the use of formic aldehyde in the treatment of corneal ulcers, muco-purulent and purulent conjunctivitis. He employes the Schering preparation in the strength of 1–1000 to and 1–2000, applied every four hours.

JOHN E. WEEKS, M.D.

ECHOES AND NEWS.

The Pasteur Chair.—Until recently there has been no appointment to fill the Chair in the French Academy of Medicine left vacant by the death of Pasteur. It will now be occupied by Dr. Roux who has been made an associate.

Changes in the Medical Department of the University of Pennsylvania.—At a meeting of the trustees of this institution on June 23d, Dr. Alexander C. Abbott was chosen Professor of Hygiene to succeed Professor John S. Billings, resigned.

Rush Medical College.—Professor Edwin Klebs has been elected to the Chair of Pathology in Rush Medical College. This college has recently been recognized by the Examining Board of the Royal College of Physicians and the Royal College of Surgeons, London, England. This recognition entitles its alumni to all the privileges accorded to the graduates of other institutions recognized by that Board.

Electricity as a Hemostatic.—Mr. Lawson Tait has invented an instrument by means of which the electric current can be very successfully applied to control bleeding. We have not yet seen a full description of his method.

Typhoid Fever at Plymouth Again.—In 1885 a most serious epidemic of typhoid fever raged at the little town of Plymouth, Pa. The water supply has again become polluted, and for the two weeks past there has been an alarming increase in the spread of this disease with a number of deaths. Efforts to purify the water have not met with success, and much fear is entertained by the local profession for the safety of the populace.

Vaccination of Sheep.—A member of the Pasteur Institute of Algiers has discovered a vaccine that will prevent "sheep-rot." All animals vaccinated either escape or have a mild form of the disease, from which they invariably recover.

Death of Dr. Choate.—We record with deep regret the sudden death of Dr. George C. S. Choate, which occurred in New York on June 28th. Dr. Choate was a brother of Mr. Joseph H. Choate, the famous member of the New York bar. Nearly a half century of his life has been spent in the practice of medicine in New York and Massachusetts, his native State. Besides a large practice in New York City, he has for many years maintained a private asylum at Pleasantville, Westchester Co., and it was there that Horace Greeley died in 1872. Dr. Choate continued in active practice until his death.

A Skiagraph of Li.—While in Germany recently the Chinese statesman, Li Hung Chang, took advantage of an opportunity to have the bullet which he carries in his cheek located by the Röntgen rays. It will be remembered that when in Japan, arranging the treaty of peace between that nation and his own, he was assaulted by a would-be assassin, who, it was feared at the time, had been only too successful in taking the life of this truly great man. The picture secured shows the tract of the wound through the tissues of the cheek and the encysted missile slightly below the point of entrance.

The Cavendish Lecture.—On the evening of June 17th, Mr. Thomas Bryant, ex-President of the Royal College of Surgeons of England, delivered the Cavendish Lecture to a large audience at the West End Hospital, London. The subject of the address was "Jenner and his work."

Creolin.—This popular antiseptic agent has been generally accorded entire freedom from toxic effects, but, in the light of some recent experiments upon lower animals, this superiority must be called in question. Professor Hobday of the Royal Veterinary College, England, reports in the *Lancet* that two ferrets subjected to applications of the drug, diluted with water in the proportion of two ounces to a quart, died in half an hour. Subsequent investigation proved it to be an irritant and narcotic poison to both dogs and cats, especially when applied over a considerable area of the body. Such a report emphatically suggests caution in treating extensive wounds upon the human body with creolin as a dressing.

Medical Longevity.—Rare opportunities, together with a predilection for such investigation, has allowed Dr. Salz-

mann of Esslingen, to present us with some reliable and quite interesting figures relative to the average length of life among medical men. During the sixteenth century he found it to be only thirty-six years and seven months —in the seventeenth century, forty-five years and eight months; in the eighteenth century it reached forty-nine years and eight months, while in the present century fifty-six years and seven months. The addition of twenty years to the average life of the physician has been the result of advancing scientific knowledge both as relates to prevention and cure.

A New Hypnotic.—From a species of cactus, known to the Mexicans as "Pellote," Dr. Hefter of Leipzig, has separated the active principle which he has named Pellotin. Professor Jolly of Berlin, has made a number of experiments with it upon patients in Charité Hospital, Berlin, following those previously made by Dr. Hefter upon animals and himself. He found that three quarters of a grain would almost always cause several hours of sleep, and that no subjective symptoms followed its use beyond a little giddiness in about twenty per cent. of the patients. He observed, however, a marked influence upon the pulse rate which was ten to twenty beats lower during sleep, but returned to normal on waking. It is estimated that half a grain is equivalent to fifteen grains of trional or thirty grains of chloral hydrate. The alkaloid is quite insoluble, hence the hydrochlorate is always employed.

Alcohol and Sunstroke.—During the month of January there occurred over three hundred deaths from sunstroke in Australia. When called upon to offer suggestions relative to its prevention the Medical Board promptly informed the Colonial Government that of all the predisposing causes none was so potent as undue indulgence in intoxicating liquors—and in its treatment nothing seemed to have a more disastrous effect than the administration of alcoholic stimulants. After this precaution, suggestions were offered regarding the selection of proper clothing, etc.

The Death of Dr. Langerhaus' Son Explained.—A full and satisfactory explanation of the sudden and tragic death of the little son of Dr. Langerhaus immediately following an injection of antitoxin serum has been reached through the subsequent investigation. In the first place the analysis of the serum proved it to be reliable, and no irregularity in the method of its administration could be discovered. It was found however that the child had just completed an unusually heavy meal, and as the necropsy showed his larynx and treachea well filled with a material identical with that found in his stomach the accepted inference is that while faint from the shock of the injection he was unable to eject the vomited matter from his throat and instead drew it into the air passages with fatal effect. It may be concluded then that what appeared to be quite damaging evidence against the serum is really the result of a very simple accident.

The Philadelphia Water Supply.—The Municipal Council of Philadelphia is very properly devoting much attention to the betterment of the water provided for their city. The modern method of filtration is generally favored, and a large corporation has presented a proposition promising to procure daily 350,000,000 gallons of water from the Delaware River above the city and subject it to this process. No more important economic question can engross the thoughts of a community than the condition of its water supply.

The Medical Society of New Jersey.—The New Jersey State Medical Society closed a successful meeting at Asbury Park on June 24th. The subject of the antitoxin treatment of diphtheria occupied the attention of the body. A prolonged and spirited discussion showed the members divided in their estimate of its value. The new officers elected were: President, F. J. Smith of Bridgeton; first vice-president, D. C. English of New Brunswick; second vice-president, C. R. P. Fisher of Bound Brook; third vice-president, Luther M. Halsey of Newark; corresponding secretary, E. L. B. Godfrey of Camden; recording secretary, William Pierson of Orange; treasurer, Archibald Mercer of Newark. The next annual meeting will be held at Atlantic City in June, 1897.

Living Greek in the Schools of France.—Dr. A. Rose's public lecture on the proper pronunciation of Greek, which he gave on June 5th, in the New York Academy of Medicine, was a social and philological success. It will be remembered that the meeting was presided over by Dr. S. Stanhope Orvis, Professor of Greek of the University of Princeton. And addresses were delivered by Hon. D. N. Botassi, Consul-general of Greece, Mr. Charles E. Sprague, the president of the Union Dime Savings Bank and a Philhellen besides, and by Professor Leotsakes. Now it appears that it is to become an event of unusual significance. Almost simultaneously with this meeting the Greek journals brought the official news that the French Government had ordered the abandonment of the Erasmian, and the introduction of the living Greek, pronunciation in all the schools of the French Republic in which Greek is taught, and had induced the Greek Government to call together a committee, under the presidency of the Minister of Public Instruction in Greece, for the purpose of making propaganda for the introduction of the living Greek pronunciation in other countries besides France. The first steps toward the appointment of such a committee has been taken by the Greek ambassador in Berlin. The committee will publish a scientific work to prove the correctness of the living Greek pronunciation; to show the advantages of the introduction of living Greek in place of Erasmian pronunciation, and finally to prepare a memorandum instructing the representatives of Greece in foreign lands how to act in the matter. The facility with which living Greek is acquired by the natural method of speech places it on a par with any other modern language. Indeed, with the introduction of living Greek in all the schools of the civilized world, the idea of having Greek for an international language for medical schools does not appear so Utopian as some have pronounced it.

SOCIETY PROCEEDINGS.

SECOND ANNUAL MEETING OF THE AMERICAN LARYNGOLOGAL, RHINOLOGICAL, AND OTOLGICAL SOCIETY,

Held in New York City, April 17 and 18, 1896.

EDWARD B. DENCH, M.D., of New York, President.

FIRST DAY—APRIL 17TH.

THE DIAGNOSTIC VALUE OF OPHTHALMOSCOPIC EXAMINATION IN CEREBRAL DISEASE DEPENDING UPON AFFECTIONS OF THE EAR.

DR. THOMAS R. POOLEY, in a paper on this subject, said that probably the first to call attention to the value of the ophthalmoscope in this connection was Dr. Kipp of Newark. One of the cases reported by him was of special interest. It was one of acute purulent inflammation of the middle ear, with double optic neuritis, but without tenderness, swelling, or spontaneous pain in the mastoid process. The patient complained of pain and throbbing in the ear which had lasted for six weeks. The tympanic membrane was of a deep red color, and much swollen. The ophthalmoscope showed the eyes to be entirely normal. A free opening was made in the drum membrane, and the cavity syringed out daily. About two months later, the ophthalmoscope revealed a well marked optic neuritis in both eyes, although vision was not impaired in either eye. The temperature was 99°, pulse 72, and there was no chill. The mastoid was opened and thoroughly cleaned out subsequently, and this was followed by improvement. After a month or two the discharge ceased entirely. The optic neuritis remained stationary for about one week after the operation, and at the end of a few weeks had almost entirely disappeared. She had been kept under observation and had remained in good health, the vision and optic disks being normal.

His own case was one of purulent otitis media occurring in a young boy. He had had otorrhea for many years, and some years previously Wilde's operation had been made at Budapest. When first seen by the speaker, the temperature had been 102.5° and the pulse 128. Wilde's incision was made, and quickly followed by a subsidence of the temperature, but another rise of temperature occurred the next day. Schwarze's operation was then performed, and about a dram of foul, caseous matter removed from the antrum. During the operation, a considerable part of the surface of the dura was exposed in the wound. For twenty days the temperature oscillated between 101.5° and 105.5°, and the patient showed occasional maniacal excitement. At the end of this time, the patient became blind in the right eye and the ophthalmoscope showed optic neuritis on the right side and violent hyperemia on the left. Hemiplegia then developed and soon afterward the patient died. At the necropsy, the vessels of the dura were found to be intensely engorged, and there was a layer of thick, foul-smelling pus which bathed the left hemisphere. The optic nerve was swollen. The cerebellum was normal. A large encapsulated abcess was found in the anterior portion of the occip ital lobe on the left side, and around this the brain was softened. It was found that the dura at not been perforated at the mastoid operation.

The following conclusions were drawn: (1) That the ophthalmoscope was valuable in arriving at the diagnosis of cerebral disease, in some instances by confirming the evidence given by other symptoms, in others, by giving the principal, if not the only reliable evidence of brain disease. (2) The intraocular end of the nerve is never inflamed where the disease remains limited to the middle ear and mastoid, but is certain evidence of brain disease. If, therefore, optic neuritis is found, the diagnosis of extension to the brain is certain, whether or not there are other evidences of this condition. (3) The form of optic neuritis is always that seen in affections of the brain, viz.: choked disk—and this may vary from simple evidence of stasis to the pronounced choked disk. In his opinion, the various forms of neuritis described were only different degrees of this particular form of optic neuritis. The presence of optic neuritis was unfortunately no aid in the solution of the problem of determining the localization and nature of the disease. (4) It occurs most frequently in chronic purulent otitis media than in acute cases. In the latter it is very rare. (5) The list of brain lesions in which optic neuritis is observed embraces nearly all the usual lesions—abscess of the brain, meningitis, and sinus thrombosis. (6) The occurrence of optic neuritis in otitis media chronica with implication of the mastoid, and a history of long-standing otorrhea is, by inference, due to a cerebral abscess. (7) The extent to which the presence of slight edema of the optic disk should influence us in determining the operation on the mastoid was an open question, but he thought we might accept Andrews' conclusion, that as the operation, when properly performed, is not dangerous, we may accept edema of the optic disk as an indication for opening the mastoid, with the object at least of establishing free drainage from the middle ear. (8) The existence of optic neuritis as an indication for the more serious operation, such as exploration of the brain for intracranial disease, could only be considered in connection with other symptoms, but so far as it went, it made the presence of intracranial disease more certain.

DR. J. HERBERT CLAIBORNE said that the conclusions presented in the paper covered in a succinct manner nearly all that was known on the subject. Many did not perform the mastoid operation in the manner that Schwarze did. Of this he could speak positively because he had studied at Schwarze's clinic. In none of the cases seen there had there been any symptoms pointing to ocular trouble. In Berlin he had seen for seven weeks an interesting case—one of chronic purulent otitis media. She had suddenly developed a high temperature and delirium, and had died before morning. The autopsy showed that the pus had passed through into the meninges of the brain and had excited a purulent meningitis. It seemed to him that the optic neuritis could hardly be a reliable guide as to the best time to allow the wound to close; the ordinary guide in practice was whether or not the wound was healing properly from the bottom. He doubted whether optic neuritis would prove to be a trust-
o rthy guide to the necessity of operation.

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Dr. Pooley said that he did not wish the conclusions to be accepted as entirely his own; they had been intended to represent rather what had been gleaned from the literature of the subject. He felt sure, however, that optic neuritis would be found much more frequently if the physician took the trouble to look for it. The percentage of cases in which the eye is affected in purulent middle ear disease has not yet been determined.

REPORT AND EXHIBITION OF A CASE OF UNUSUAL SPEECH DEFECT.

DR. G. HUDSON MAKUEN of Philadelphia, presented a case of this kind in the person of a young law student. When six months old, this young man had lost the sight of one eye; when seven years old, he had had a severe attack of diphtheria, and another at the age of twelve years; and he had had scarlatina at the age of ten. The purulent otitis media had existed since the scarlatina. In 1893, there had been an acute suppuration of the attic, and aggravation of the old trouble. Adenoid vegetations had been removed on two occasions. There was a marked retraction of the lower jaw, which destroyed the character of the labial sounds, and this could only be overcome by long practice in protruding the lower jaw when speaking. The soft palate was greatly relaxed and was impeded in its action by the adenoid growths. It trying to say "s," instead of the palate rising to the roof of the mouth, it remained down on the tongue, The adenoid thickening in the pharynx was looked upon as the original cause of the defect of the speech, and the patient was carefully instructed as to the best method of securing improved articulation by careful and persistent practice.

DR. H. HOLBROOK CURTIS of New York, exhibited the instrument devised by Professor Oertel of Munich, for viewing the vibration of the vocal cords. The instrument is constructed on the principle of the well-known siren, and is set in motion by an electromotor. If, for example, the siren and the patient are made to sing the same note, say C, there will be 512 vibrations of the vocal cord per second, and the same number of interruptions of the visual field by the siren, and the observer will see that portion of the vocal cord which appears perfectly at rest. By passing slowly from one side of the cord to the other, and properly adjusting the speed of the instrument with reference to the note sung by the patient, the observer can see the nodes and segments of the entire cord. By this instrument, the speaker said, it had been absolutely disproved that sounds are made by the vocal cords coming together, except for a small part posteriorly. With this instrument, the "nodules of attrition" could be seen, and the patient could be taught by a new method to sing in such a way as to remove these nodules inside of a week, even in cases of very long standing. The patient should be given a certain note to sing, and should practise singing this note according to a certain method for hours every day. In this way a very speedy cure of this trouble some disorder among singers could be secured.

Dr. Curtis also exhibited a modification of Ziegel's auroscope.

OTITIS MEDIA SUPPURATIVA WITH AN UNUSUAL PERFORATION OF THE MASTOID.

DR. E. E. HOLT of Portland, Me., reported a case of this kind occurring in a man, forty-five years of age, who had begun to have headache on June 22, 1895. When seen by the speaker on July 30th, there was a perforation on the anterior inferior portion of the membrana tympani through which muco-purulent matter was discharged. He complained at times of pain and tenderness. The ear was treated with cleansing and astringent solutions. There was no tenderness or swelling of the mastoid, but there appeared to be a slight prominence in this region. There had been a very slight rise of temperature at times. After twenty-one days of this treatment, he had decided to chisel away the mastoid, and on doing so he had found the bone extensively necrosed, and pus tracks leading down into the intermuscular spaces in the neck. The speaker deprecated the common practice of dismissing a patient with the simple direction that the ear should be frequently syringed out; it was much safer and better, if the case could not be kept under constant observation, to direct that the ear be kept lightly plugged with clean cotton, and not syringed at all.

THE PRESIDENT said that these cases opening into the digastric fossa were among the most interesting with which we had to deal. He had recently seen a very similar one. Although the temperature had been taken at intervals of two hours, there had been no elevation of temperature. At the first incision, pus was evacuated, and it was found that the interior of the mastoid was entirely broken down. The only symptom of mastoid inflammation in this case was local tenderness and a sinking of the upper and posterior wall. His own experience had been that patients were more apt to infect the auditory canal with cotton than if they left it alone. While it is usually unwise for a patient to syringe out the ear, one of the family could be easily taught to do it properly.

A CONTRIBUTION TO THE STUDY OF LAYNGEAL VERTIGO.

DR. A. C. GETCHELL of Worcester, Mass., in a paper with this title, stated that he had succeeded in collecting forty-one cases. Five of these were over sixty years of age, nine were between fifty and sixty years, thirteen were between forty and fifty years, and the others were still younger. Ten were asthmatic, one was epileptic, and one had an epileptic brother. Loss of consciousness was expressly stated to have occurred in thirty-two cases, and falls in twenty-six. Slight mental confusion was noted in five; dizziness was mentioned in eight cases; true vertigo was mentioned but once. In thirty-three of the cases it was due to violent cough. Tickling or burning sensations about the larynx were mentioned in thirteen cases; congestion of the face was noted in ten; two were reported as pale; bronchial asthma occurred in eight cases. Most of the cases had several attacks, although sometimes at quite long intervals. The treatment had consisted in the internal administration of the bromids, and local measures for the abnormal conditions about the larynx.

The speaker said that Charcot had first described the

disorder and had given it its name, but this certainly did not give a correct notion of the disorder. The average age of the patients was against the theory of its epileptic origin. If the theory of forced expiration were correct, it would seem that obstruction of the circulation should be noticed prior to the attack. The circulatory condition is probably nothing more than an exciting cause in a limited number of cases. Five of the series had nervous temperament. A history of epileptic seizures was not infrequent. It could not be denied that the fundamental pathological fact is an unstable condition of the nervous system. Brown-Sequard's researches showed that the larynx has an intimate nervous connection with the nervous system. The author's conclusions were: (1) That laryngeal vertigo occurred in persons in whom there is an unstable nervous equilibrium; (2) that there was usually some condition of the upper air passages liable to cause glottic spasm; and (3) that severe paroxysmal coughing may cause syncope, but only when there is an existing disorder of the central nervous system.

DR. SARGENT F. SNOW of Syracuse said that he had seen a case of laryngeal vertigo or epilepsy some years ago. A laboring man, about twenty-four years of age, had come to him for examination of the larynx, and had said that he would completely lose consciousness at times, for perhaps thirty seconds. The larynx was found to be markedly congested, the cords were reddened, and he was somewhat hoarse. During the first examination he lost consciousness five or six times as a result of the irritation of the laryngeal mirror. There appeared to be a distinct spasm of the larynx. His physician had been treating him with bromids, but without benefit. This was stopped, and he received treatment directed toward controlling the congestion of the larynx. All his laryngeal symptoms disappeared, and did not return. One member of his family had suffered from epilepsy.

DR. WENDELL C. PHILLIPS of New York said that the only case of this kind that had come under his notice had presented an unusual symptom—a well-marked chronic bronchitis, with bronchorrhea. All the laryngeal attacks had begun with a severe spell of coughing, and then he would fall down and completely lose consciousness for a moment. He had found that treatment of the bronchitis yielded the best results, although the cure was aided by local treatment of the larynx.

DR. R. C. MYLES of New York said that he had seen an interesting case of this kind a few years ago, in a man about fifty years of age. This man was subject to attacks of bronchitis and coughing, and at such times would occasionally suddenly become unconscious for a moment, and then fall. He was a high liver. His diet was somewhat restricted, and the treatment directed to the larynx, and under this a cure was effected. It should be noted that in all cases of death from impaction of a foreign body in the larynx the individual falls unconscious with great suddenness.

DEVIATION OF THE NASAL SEPTUM; OPERATION.

DR. WENDELL C. PHILLIPS of New York, presented a boy who, while playing "shinny," was struck with the stick over the nose. This caused a severe nasal hemorrhage, which subsided without special treatment. Many months later he had been first seen by the speaker. Examination showed almost complete occlusion of both nostrils, as if the blow had caused the septum to be driven back upon itself. Four weeks ago, he broke up the septum completely with the Adams forceps and introduced the perforated cork splints devised by Dr. Berens. These had just been removed and the result was quite satisfactory.

DR. C. W. RICHARDSON of Washington, D, C., said that he had operated upon a number of cases of V-shaped deflections of the septum, but he had found that the septum would drop back into the old position. Since he had used the perforated splints of Dr. Berens, the results had been very good. The reaction from the introduction of these splints usually subsided in three or four days.

DR. DWIGHT L. HUBBARD of New York, said that the great point was not to be in a hurry to remove these corks. He had frequently left them in ten days without any harm. Another point was not to leave out the corks altogether too soon, He had found that relapse had sometimes followed removing them after four weeks, but never if they had been left in for six weeks.

DR. H. H. CURTIS said that he considered this splint the most scientific and useful of the splints devised for this purpose. After doing one of these septum operations recently he had been surprised to find that the patient was a "bleeder." The hemorrhage was stopped by a very light plugging with styptic cotton. He believed that light plugging and pressure with a copper wire at the right spot constituted the best method of checking such hemorrhage,

DR. EWING W. DAY of Pittsburg, said that once while operating under ether he had met with a tremendous arterial hemorrhage after the first incision of the septum, and the patient had nearly lost his life from it. He preferred now to operate under local anesthesia.

DR. PHILLIPS, in closing the discussion, said that Dr. Asch recommended cutting the septum at the point of greatest deflection—near the middle—by means of a specially devised pair of scissors. The trouble in Dr. Day's case was probably that he cut too close to the floor of the nostril. He had seen ulceration and perforation of the septum result from undue pressure brought about by the prolonged use of two splints.

DR. MYLES presented a case for diagnosis; it presented some of the features of

ACTINOMYCOSIS BOVIS.

It had been under observation only a few days. He said that he had seen several cases of true actinomycosis bovis, and most of them had been examined microscopically so that there could be no doubt about the correctness of the diagnosis. They had been cured by extirpation of the growths. The growths appear hard, tough, and leathery, like the lichen on wood.

REPORT OF A CASE OF HEMORRHAGE FROM THE EXTERNAL AUDITORY CANAL,

by DR. C. W. RICHARDSON of Washington, D. C.

The patient was a woman, thirty-six years of age, who had at first hemorrhages lasting for a day or two, and recurring at intervals of a week or more. This continued for a period of six months. In February, 1895, the bleeding became profuse and persistent. It had no reference to the menstrual function. Examination showed no solution of continuity throughout the whole canal, or of the membrana tympani. The Eustachian tube was patulous. Pain was experienced throughout the whole history of the case, particularly in the region supplied by the trigeminus. After several months of observation he had become convinced that the patient was neither hysterical nor a malingerer. The exact source of the hemorrhage could not, however, be determined.

DR. POOLEY referred to a case of hemorrhage from the auditory meatus which at first was puzzling, but it was finally found that the blood issued freely from a perforation in the drum. Further examination showed petechial hemorrhages in different parts of the body, and the diagnosis of scurvy was made. The case terminated fatally, and the necropsy showed the usual conditions found in scurvy, including the petechial hemorrhages into the brain.

THE PRESIDENT said that the tenderness along the trigeminal distribution would seem to indicate that the case reported appeared to partake of the nature of herpes —in other words, that through some interference with the nutrition of the walls of the blood-vessels the hemorrhage occurred. A somewhat similar condition was found among gouty individuals.

DR. RICHARDSON, in closing the discussion, said that the blood had been examined, but with negative result. There was no indication of scurvy in his case, or of the hemorrhagic diathesis, for she had been operated upon previously without the occurrence of unusual hemorrhage.

HYSTERICAL AFFECTIONS OF THE MASTOID.

DR. J. E. SHEPPARD of Brooklyn, read a paper with this title. The first case reported by him was that of a girl, eighteen years of age, in rather poor health, who came to him with the history of deafness for three years, and of pain and tenderness around the right ear for the past three weeks. Bone conduction was better than aerial conduction. Firm pressure could be made over the part without causing pain. The patient was given sodium bromid, and in a few days was well. The second case was that of a young woman, twenty-one years of age, who had fallen down an elevator shaft. Recently she had felt dizzy, and had exhibited a tendency to fall backward to the right side. She complained of pain around the ear. The mastoid region appeared to be tender, but not at all edematous or swollen. A proposition to operate did not lessen her symptoms at all, and for several days he had been in doubt as to the correct diagnosis. Two *séances* of partial hypnosis produced a cure. The third case was a woman, twenty-three years of age, who stated that for the past few months, following a cold, she had suffered from pain in and around the ear, without any discharge. Examination showed no evident cause for the condition, and the diagnosis was made of hysteria, and her attending physician was advised to treat the case by "suggestion." He had been unable to learn the outcome of this case.

DR. RICHARDSON said that not long ago he had been guilty of operating upon a case of this kind. The patient was a young woman, about eighteen years of age, who had been treated six years ago for suppuration of the right ear. When seen again, the ear was once more suppurating, and there was extreme tenderness over the mastoid region. She had become hysterical as the result of grief over the death of her mother. There was no edema or redness over the mastoid, but it was well known that there were cases of serious mastoiditis without the usual signs. After waiting about two weeks, he had opened the mastoid cells, only to find them perfectly normal. The patient was, however, completely cured.

DR. MYLES referred to the case of a young lady in most comfortable circumstances, who had suddenly developed extreme tenderness in the mastoid region. The girl was hysterical, and he had some reason to suspect that she purposely irritated the ear. The girl was greatly pleased with a proposal to open the mastoid, but after consultation this was postponed, and the patient recovered without further treatment.

DR. PHILLIPS recalled a case of recurrent furunculosis of the canal, and finally of severe pain and tenderness in the mastoid. One day, she forgot to remove the articles that she had been introducing surreptitiously into the ear, and examination showed a fragment of a pin and several pieces of finger-nails in the canal.

DR. J. E. NICHOLS said that in one case which he had seen, the mastoid cells were healthy, but the patient had been cured at once by opening them. In another case in which there was an excoriation of the anterior wall of the canal, and in which he suspected that the hemorrhages complained of had been produced by picking this spot with a pin, hypnotic suggestion was only temporarily beneficial, but a proposal to operate was sufficient to effect a cure. It was not at all improbable that there might be some elevation of temperature in these cases, thus still further obscuring the diagnosis, but ordinarily this elevation would be slight.

THE PRESIDENT said that in this discussion nothing had been said about the result of comparing the two sides. In these hysterical cases in which pain was complained of on one side, there was usually as much tenderness on the other side. He recalled a case in which, at each menstrual epoch, there would be a marked edema and tenderness over the mastoid. Such a condition must be looked upon as anglo-neurotic in character.

SECOND DAY—APRIL 18TH.

PHARYNGEAL TUBERCULOSIS.

DR. ROBERT LEVY of Denver, Col., said that he had preserved records of 162 cases of laryngeal tuberculosis. Of this number, 17 showed pharyngeal tuberculosis. Ulceration of the hard palate was the least frequent. The severity and course of this affection depended upon the number and location of the areas affected. When several points of attack develop simultaneously, or there is an ex-

tensive process going on in the lung, or when the posterior wall alone is involved, extension is slow. The coexistence of syphilis he considered to be the most important modifying circumstance. The stages of pharyngeal tuberculosis depended upon the mode of infection. When the infection occurred through the lymph channels, ulceration seemed to be the method of attack; where there was a local invasion, there would be an acute pharyngitis and the development of superficial pin-head tubercles. The diagnosis was not difficult in typical cases. In those cases complicated by syphilis, the character of the ulceration might be puzzling; there would be usually slight pain, and the case would pursue a sluggish course. The finding of tubercle bacilli, the condition of the lungs and the results of treatment would enable one to make the diagnosis. Nitrate of silver, forty grains to the ounce, was useful in the early stage, when the ulcerations were few and small. Curettage and lactic acid had given him fair satisfaction, but the galvano-cautery had proved to be the best of all the agents he had employed. Cocain spray and iodoform insufflation were valuable for home treatment. When combined with syphilis, his experience was in favor of the use of mercury in small doses rather than potassium iodid—he had been forced to the conclusion that the Colorado climate was unfavorable to pharyngeal tuberculosis. His conclusions were: (1) That pharyngeal tuberculosis occurred in one and a half per cent. of all cases of phthisis; (2) that there were two sources of infection—(*a*) local attack on an abnormal mucous surface, and (*b*) through the lymph channels; and (3) that the severity of the symptoms was modified by the site of the attack and the existence of laryngeal and pulmonary complications and the association with syphilis.

DISEASES AND TREATMENT OF THE NASAL ACCESSORY SINSUES, WITH AN ANALYTICAL REPORT.

DR. ROBERT C. MYLES exhibited some drawings taken in a darkened room in 1893 by means of transillumination. These had been presented to the Academy of Medicine in 1893. In polypoid cases he had entered the sinuses through the nose many times. About two-thirds of the cases of ethmoid disease were due to polypoid disease, and one-third to atrophic rhinitis, non-syphilitic necrosis syphilis and neoplastic growths. At the present time, he had three cases of sphenoidal empyema under treatment, and he had come to the conclusion now that the nose and teeth were about equal as casual factors of antrum disease. The simple irrigation tube and small trocar and canula he considered invaluable aids to diagnosis. Not so much depends upon the pathology as upon the extent of the pathological process. He thought it was the physician's duty in all acute and subacute cases of catarrh to employ either expectant or exploratory treatment. Exploration in antral cases is carried out by irrigation through the natural opening or through a small artificial one. There are hundreds of cases of sinusitis with muco-pus, in which there was no solution of continuity of the membrane. He had operated by almost every method that had been recommended, and all the milder cases had done well. He recalled a case which terminated fatally, in which death might have been averted by the operation suggested which the patient had refused. He had adopted the rule of operating externally in frontal sinus disease when the symptoms were profound, and were not relieved by other methods. In extreme polypoid cases, the ethmoid was rather brittle; it was almost flinty hard in the supperative cases. After removal of the middle turbinated bone it was his practice to drill or gouge an opening into the cells, and cut away as much of the cells as possible. All his cases have been relieved in this way, and some cured. The sphenoid cells were not so difficult to open as many seemed to think. He did not believe curetting the upper and posterior wall of these sinuses was safe. The cells were from one to one and a half inches in depth. He did not agree with the general surgeons that the antrum of Highmore should be treated as other diseased cavities are treated. Curetting often aggravated rather than helped the condition. Where the tooth appears to be the cause of the trouble he advised removal of the tooth, and penetration through the socket into the antrum. This method was so simple and harmless that it should be made a part of the expectant treatment.

DR. PHILLIPS said that he quite agreed with the reader of the paper regarding the etiology of antral disease. He found that the dental profession was very much inclined to follow the teaching that almost all antrum cases were due to some defect in the teeth or in the bone. In his opinion, inflammation of the antrum was not an infrequent disease, but suppurative inflammation of the antrum was more rare, He did not think it was necessary to remove a tooth if the teeth were perfectly sound; it was better to penetrate through the canine fossa. A few weeks ago he had seen a man who gave every indication of suppurative disease of the antrum. By transillumination he had found that there was a bright area on the right side, and a dark shadow on the left side. Some observers claimed that transillumination was unsatisfactory, but the reason usually was that it was not properly performed. The source of the illumination should be placed in the mouth, and the observer should note the character of the illumination beneath the eye. He would be unwilling to operate in a case with darkness on one side and light on the other, unless there were other symptoms of antrum disease. Transillumination is a useful aid, but should not be considered in itself sufficient ground for a positive diagnosis. He had found that by percussing over the the antrum in this patient tenderness had been elicited on the right side. Cocain cataphoresis was used in this case, with a current of fifteen volts. A free opening was made into the antrum and, according to the statement of the man, the operation was painless. Last summer he had seen a man who had rapidly developed an acute inflammation in the frontal sinus, following upon a violent insufflation of powder on that side. This insufflation had been done in one of the advertising quack catarrh cures in this city. An abscess suddenly developed. He had followed Dr. Myles' plan of making the incision. As soon as the opening was sufficiently large, the polypi forced themselves out through the opening that he had

made in the frontal sinus. He removed nearly half an ounce of polypoid material from the sinus. The man had been advised to come back for a second curetting, but this he had positively refused to do and, hence, it was not improbable that there would be a relapse. Recently he had been operating upon a colored cadaver, and had been surprised at the extreme smallness of the sinus.

DR. G. HUDSON MAKUEN said that a few weeks ago he had reported a case of unusual alveolar abscess with antral complications. The patient had complained first of pain around the second molar tooth in the upper jaw on the right side. After two or three days a slight sero-purulent discharge made its appearance between the gum and the tooth. A dentist who saw the case expressed the opinion that the case was one of alveolar abscess. On opening the tooth he found it apparently healthy. The tooth was devitalized and the pulp removed, but without benefit to the patient. Shortly after this, while probing, the dentist passed his probe into the antrum. On removing the tooth, a small pus sac was found, midway on the tooth. This sac was half an inch from any infection by way of the mouth, and certainly no infection could have come through the antrum. His experience had been that when a large opening was made at the floor of the antrum, the cavity did not drain through this opening unless there was an obstruction of the natural opening. He suspected that the movements of respiration caused a suction through the nose, and thus accounted for drainage taking place against the action of gravity.

DR. E. E. HOLT said he desired to express his high admiration of this paper from the standpoint of the ophthalmologist and otologist. In cases of orbital cellulitis, one was often brought in contact with the antrum of Highmore.

DR. DAY said that he had found quite a number of cases in which transillumination showed a shadow on both sides, and sometimes on one side, without any other indication of antrum disease. He had, therefore, become somewhat skeptical as to the value of transillumination in diagnosis.

DR. MYLES, in closing the discussion, said that there were thousands of people in this country who had been suffering for years from catarrh, and from antral disease, and yet they had been treated by very competent physicians. The remark that had been made about the smallness of the frontal sinus reminded him of the fact that some colored people seem to have no frontal sinus, or only a very small one. It was an easy matter in such cases inadvertently to make an opening directly into the cranial cavity while operating. In his experience, most the cavities of the nose appeared to drain by a to and fro motion of the air, due to the respiratory movements. Regarding the matter of transillumination, the speaker said that hundreds of people presented a dark shadow beneath the eyes, but in almost any case the shadow could be made to disappear by the use of sufficiently powerful illumination. There were many drawbacks to transillumination, but it was nevertheless a very valuable aid to diagnosis, and one which should not be neglected.

ACUTE OTITIS MEDIA AS A COMPLICATION OF TYPHOID FEVER.

DR. D. A. HENGST of Pittsburg read a paper on this subject. He said that when we considered the convenient pathway for microbes through the Eustachian tube to the ear, it was not surprising that this affection was so common. As a result of a collective investigation that he had made, he had received reports of 1228 cases of typhoid fever, 575 of which were from private practice, and 653 were hospital cases. There were 11 cases of otitis media reported among the former number, and 17 from the latter. Out of 389 cases of typhoid fever occurring in the Johns Hopkins Hospital, it had been reported that there were 8 of acute otitis media. It most commonly developed from the end of the second to the fourth week, or at the time when the capillary circulation was sluggish and the patient in a delirious condition. He had not been able to gather statistics regarding the frequency of mastoid complication. In connection with the question of the influence of quinin on the production of otitis media, it should be noted that one physician who reported 175 cases of typhoid fever, with 5 of otitis media, stated that it was his practice to use large doses of quinin during the stage of hyperpyrexia. The most usual method of extension was from the mouth or naso-pharynx into the ear. The chief symptoms of this complication were deep-seated pain and tenderness on pressure below the auricle, a feeling of pulsation and tinnitus. In some cases of typhoid fever there is a severe neuralgic pain in the ear, but there is no deep-seated pain below the auricle, and the accompanying changes observed on examination with a speculum are not present. If seen early, or in the hyperemic stage, leeches should be applied to the tragus, and the instillation of a warm solution of boric acid will often be followed by prompt relief. The ear should be frequently cleansed, and as soon as bulging is observed, the membrane should be incised. The parts should be kept thoroughly aseptic afterward. In nearly all cases of otitis media complicating typhoid fever, good hearing has been the result.

THE PRESIDENT said that he certainly thought acute inflammation of the middle ear was a very rare complication of typhoid fever. He did not believe in the use of moist heat in the early stage of the inflammation, because this tended to break down tissue. In his experience, dry heat relieved the pain quite as well as moist heat, and was free from the objection just stated. He would also favor a resort to incision of the drum membrane before the membrane bulged, as the object was largely to secure depletion. A great variety of germs appeared to be responsible for such an inflammation of the middle ear.

ULCERATION OF THE NASAL SEPTUM.

DR. T. C. CHRISTY of Pittsburg read a paper with this title. He said that the onset of the trouble was usually attributed to taking cold. It was ushered in by pain over the frontal region, corresponding to the obstructed nares, and by pain in one or both ears. There were usually signs of acute inflammation over the obstructed nares. In the majority of cases, the lesion originated on the septum, and was communicated to the other parts by the swollen

soft tissues. In one case there was inflammation of the septal cartilage. In no case was there destruction of the hard palate, as so frequently occurred when the septum nasi was involved. The galvano-cautery is not a valuable agent in the treatment of lesions of this character. Tubercular ulcers are, as a rule, secondary, slow in development, and painful. Malignant ulcerations are painful, and often have an inflammatory appearance. His observations had led to the conclusion that the prolonged residence in a high altitude was, in some instances, pernicious to the delicate mucous covering of the septum nasi.

DR. ROBERT LEVY said that he must take exception to the statement that prolonged residence in high altitudes was pernicious to the nasal mucous membrane. In an experience of ten or twelve years in a region situated over one mile above the level of the sea, drying, crusting, and annoying nasal symptoms had been observed only among those who had recently arrived. After a time Nature met the demand for rapid evaporation of water at such high altitudes, but at first these individuals usually suffered from dryness and excoriation from picking the dried secretions.

DR. ARTHUR G. ROOT of Albany said that he knew of no disease which was so amenable to treatment as syphilis, whether in the nose or in any other part of the body. He was firmly convinced that many physicians were disappointed with the results or their anti-specific treatment because they expected marvelous benefit from simply giving of these remedies without taking into account the general condition of the patient, and what could be obtained by careful hygiene and good nourishment. Some of these patients would do better for a time if the anti-specific remedies were suspended and reliance placed entirely in hygiene and diet.

DR. SNOW said that in these cases of tertiary syphilis, much of the trouble in managing the case was due to insisting upon the use of mercurials instead of trusting to potassium iodid. In cases of ulceration of the septum, not due to syphilis, he had found deliquesced chromic acid acted admirably.

DR. HOLT said that he desired to heartily indorse what had been said by Dr. Root about the hygenic treatment of syphilitics. In many cases he had gotten better results from sodium iodid than from potassium iodid, the former being better tolerated by the stomach.

DR. W. B. JOHNSON of Paterson, N. J., thought it was somewhat dangerous to undertake to feed up a syphilitic patient and suspend medication, while the disease was actively engaged in dragging him down. He was positive that the combination of potassium iodid and mercury often acted better than iodid alone.

DR. MAKUEN said that in the past year he had had two such cases in which the diagnosis had been rather difficult. The first was a young women in whom there was no suspicion of syphilis. A pathologist reported that the case was one of round cell sarcoma, but the operation having been unavoidably delayed, the patient was put on anti-syphilitic treatment, and was speedily cured. It another case, that of a man who denied syphilis, he was still in doubt, but was trying anti-specific remedies.

DR. LEVY said that he was reminded of a case in which two microscopists had independently examined the case, and had reported it to be one of round cell sarcoma. This patient had had many of the symptoms of a malignant growth, yet she was speedily cured by anti-syphilitic treatment.

DR. CHRISTY said that the object of his paper was to emphasize the importance of preserving, in every way possible, the integrity of the mucous membrane of the nose in all cases.

THE MASTOID AND INTRACRANIAL COMPLICATIONS OF MIDDLE-EAR SUPPURATION.

DR. EDWARD B. DENCH of New York, read a paper with this title. In describing the operative treatment of mastoid disease, he said that he considered that a mastoid operation, done with proper attention to technic, was perfectly justifiable as an exploratory procedure, and was devoid of danger. He had operated upon 105 cases of mastoid disease, of which five had died. Three of these were cases in which meningitis was the cause of death, and had existed at the time of the operation. The other two were due to prior cerebral abscess. In this large number of cases, therefore, not a single death could be attributed to the operation. An absolutely perfect asepsis should be secured, as much care being taken as in preparing for an intraperitoneal or an intracranial operation. The incision was ordinarily made about half an inch beyond the auricular attachment, but personally he preferred to begin it at the tip of the mastoid, and carry it toward the insertion of the mastoid, leaving a space of about one-eighth of an inch. The incision should be carried up toward the superior part of the auricle. Within the triangular space bounded by two tangents, one drawn to the superior wall, and the other drawn to the posterior wall, and the curvilinear line of the meatus, lay the point of safety. Drilling should be abandoned, and the opening into the bone made by a chisel. So far as he knew, Dr. E. Gruening had been the first to lay down definite rules for the systematic opening of the mastoid. The first objective point in the operation should be the mastoid antrum. After a probe had been passed from the antrum into the middle ear, it was safe to remove the tip of the mastoid or take what further steps seemed necessary. The *additus ad antrum* should be carefully curetted, for otherwise the discharge is apt to persist. If the incision were made in the usual place, the ear was apt to remain for a long time pushed forward, and deformed, which was not the case when the incision was made as he had recommended. The bony cavity alone should be packed, the external wound being left free from the dressing. If there were no pain or elevation of temperature, he often allowed the first dressing to remain unchanged for five or seven days. If the lateral sinus should be opened, the hemorrhage could be easily controlled by firm packing with iodoform gauze.

The speaker also reported a successful case of operation in a patient having leptomeningitis. An incision had been made from the tip of the mastoid over the ear to the external angular probes of the frontal bone. He had then

entered the middle cranial cavity through the thin portion of the squamous bone. There was a distinct meningitis present at this time. There was no purulent accumulation found in the region of the roof of the tympanum or the lateral sinus. The wound was packed, except in the region of the tympanic roof. The man had had no further trouble, and recovery had been prompt. In doing an exploratory operation, an ample cutaneous incision should be made over the external meatus.

DR. R. C. MYLES said that during the last few years he had been studying this subject, and had operated between one and two hundred times on the cadaver. The points made regarding the method of making the incision and reaching the antrum were particularly valuable. He raised the question as to whether we should chisel at the upper level of the osseous margin or at the center. His plan was not to destroy the upper posterior part, but to expose the cells just posterior to the osseous canal, and extend the opening in a spiral manner upward, inward, and forward through the antrum into the attic. The approach to the lateral sinus could be usually determined by the great hardness of the bone and the bluish color of the part.

DR. W. B. JOHNSON said that there were times when it was very difficult to secure absolute asepsis. He had been greatly interested in the case of leptomeningitis which had recovered after operation, yet he felt that it would be extremely rare for recovery to follow in cases in which meningitis or cerebral abscess existed prior to the operation.

DR. RICHARD FROTHINGHAM of New York, remarked that some very good operators still used the drill.

DR. DENCH, in closing the discussion, said that some good operators still used the burr, but this was very different from the old hand-drill to which he had referred.

REVIEWS.

THE DISEASES OF CHILDREN. By J. LEWIS SMITH, M.D., Clinical Professor of Diseases of Children, Bellevue Hospital Medical College, etc. Eighth edition. Pp. 987, with 273 illustration and 4 plates. New York and Philadelphia: Lea Bros. & Co.

THE general character and scope of this work is so well known that it will be necessary only to refer to the changes which have been made in this new edition. The work has been considerably enlarged, and several entirely new chapters appear. On page 27 are interesting tables concerning the temperature, pulse, and respiration of healthy infants, which are a valuable addition to our knowledge upon these subjects. It is striking that so slight a difference was found between the rectal and the axillary temperatures of early infancy, this being only 0.2° F., and even during the second year it is only a little over 0.5° F.

The early chapters upon general subjects appear practically unchanged.

The article on diphtheria contains a number of new pages, and is brought down fairly to date. The author might, with propriety, have omitted more of the earlier pages of this article. Concerning antitoxin he speaks in guarded language, and one is led to believe that he is not yet convinced of its value. In concluding his paragraph upon this subject, he says: "It is seen that statistics thus far are favorable for the antitoxin treatment, but it must be recollected that the type of the microbe diseases frequently changes, so that the experience of several years is often necessary in order to determine the full value of a remedy."

Among the new articles, we note a chapter upon cretinism. A whole section has been added upon diseases of the blood, contributed by the late Dr. F. M. Warner, and another section upon the diseases of the heart and circulation. All of these chapters add materially to the value of the book.

The principal addition to the work, however, consists in the introduction of chapters by Stephen Smith, M.D., upon the surgical diseases of children. These relate largely to operations, and it is really questionable whether anything is gained by adding them to the text-book. The illustrations are very familiar, and most of them are found in text-books upon general surgery. There seems to us to be no special justification for a full description of such an operation as that for strangulated hernia, for instance, with cuts of instruments employed, in a work upon diseases of children. After looking over these surgical additions, it must be confessed we would have been better pleased if the book had been kept a medical one.

Many illustrations relating to medical subjects have been introduced which add materially to the elucidation of the text.

Like its predecessors, the general make-up of the book is exceedingly satisfactory; the paper and type are all that could be desired, and the new edition is likely to hold its own among the leading text-books on Pediatrics for the American student.

OFFICIAL LIST OF THE CHANGES OF STATION AND DUTIES OF MEDICAL OFFICERS OF THE U. S. MARINE HOSPITAL SERVICE FOR THE SIXTEEN DAYS ENDED MAY 31, 1896.

BOARDS CONVENED.

Board convened to meet in New York City, May 27, 1896, for the physical examination of candidates for appointment in revenue cutter service. Surgeon W. A. Wheeler, chairman, Passed Ssistant Surgeon J. H. White, recorder, May 25, 1896.

CHANGES IN THE MEDICAL CORPS OF THE U. S. NAVY FOR THE WEEK ENDING JUNE 6, 1896.

June 2.—VON WEDEKIND, L. L., surgeon, ordered to the Naval Academy.

June 3.—SIEGFRIED, C. A., surgeon, detached from the "Columbia" and ordered to the "Massachusetts."

June 3.—DERR, E. Z., surgeon, detached from the "Raleigh" and ordered to the "Columbia."

June 3.—BEYER, H. G., surgeon, detached from the Naval Academy June 5, and ordered to the "Raleigh" June 6.

June 4.—GUEST, M. S., passed assistant surgeon, detached from the "Constellation" June 8, and ordered to the "Massachusetts" June 10.